NAVAL POSTGRADUATE SCHOOL
Monterey, California

THESIS

INSPECTION OF U.S. FLAG VESSELS IN FOREIGN COUNTRIES:
AN APPLICATION OF COST EFFECTIVENESS ANALYSIS

by

Mark E. Ashley

Allen L. Thompson, Jr.

December 1983

Thesis Advisor: Earl R. Brubaker

Approved for public release; distribution unlimited

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Inspection of U.S. Flag Vessels in Foreign Countries: An Application of Cost Effectiveness Analysis		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis December 1983 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Mark E. Ashley Allen L. Thompson, Jr.		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, California 93943		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Postgraduate School Monterey, California 93943		12. REPORT DATE December 1983 13. NUMBER OF PAGES 209
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) 15a. DECLASSIFICATION DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Cost Effectiveness Analysis
Coast Guard
Commercial Vessel Safety
Regulatory Activities
Vessel Inspection

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

During the 1970's, the Coast Guard opened several overseas offices to carry out the increasing Commercial Vessel Safety activities occurring chiefly in Europe and the Far East. These offices were closed in April of 1982, to reduce operating expenses in response to political pressure and administrative initiatives to cut the federal budget. Overseas Commercial Vessel Safety activites are currently performed by U.S. based personnel travelling on temporary additional duty orders.

This thesis begins with a review of the Coast Guard's Commercial Vessel Safety program.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-LF-014-6601

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

BLOCK 20. ABSTRACT (Continued)

Procedures involving cost effectiveness analysis are reviewed and applied in an analysis of whether or not the overseas offices should be reopened. The analysis is intended to provide information to internal program managers that is useful in the decision making process.

S N 0102- LF- 014- 6601

Inspection of U. S. Flag Vessels in Foreign Countries: An Application of Cost Effectiveness Analysis

by

Mark E. Ashley
Lieutenant, United States Coast Guard
B.S., The United States Coast Guard Academy, 1974

and

Allen L. Thompson, Jr.
Lieutenant, United States Coast Guard
B.S., The United States Coast Guard Academy, 1974

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

NAVAL POSTGRADUATE SCHOOL
December 1983

ABSTRACT

During the 1970's, the Coast Guard opened several overseas offices to carry out the increasing Commercial Vessel Safety activities occurring chiefly in Europe and the Far East. These offices were closed in April of 1982, to reduce operating expenses in response to political pressure and administrative initiatives to cut the federal budget. Overseas Commercial Vessel Safety activities are currently performed by U.S. based personnel travelling on temporary additional duty orders.

This thesis begins with a review of the Coast Guard's Commercial Vessel Safety program. Procedures involving cost effectiveness analysis are reviewed and applied in an analysis of whether or not the overseas offices should be reopened. The analysis is intended to provide information to internal program managers that is useful in the decision making process.

TABLE OF CONTENTS

I. INTRODUCTION 7

A. PURPOSE AND METHODOLOGY 7

B. DESCRIPTION OF COAST GUARD COMMERCIAL VESSEL SAFETY PROGRAM 12

C. OTHER PARTY INTERESTS 20

II. COST EFFECTIVENESS ANALYSIS PROCEDURES 28

A. INTRODUCTION 28

B. PROBLEM DEFINITION 30

C. LISTING OF ALTERNATIVES 32

D. CRITERIA OF CHOICE 34

E. DETERMINATION OF COSTS 37

F. DETERMINATION OF BENEFITS 40

G. COMPARISION OF ALTERNATIVES 44

H. PROBLEMS AND CONCLUSIONS 49

III. DESCRIPTION OF THE PROBLEM, DESIGNATION OF ALTERNATIVES AND CRITERION 54

A. INTRODUCTION 54

B. PROBLEM SPECIFICATION 59

C. THE ALTERNATIVES 62

D. CRITERION 64

IV. DESCRIPTION AND MEASUREMENT OF COSTS 65

A. INTRODUCTION 65

B. CLASSIFICATION OF COSTS 68

C. DETERMINATION OF COSTS OF THE ALTERNATIVES 78

V. DESCRIPTION AND MEASUREMENT OF EFFECTIVENESS 97

A. THE EFFECTIVENESS MODEL 97

B. DETERMINATION OF THE EFFECTIVENESS OF THE ALTERNATIVES 98

VI. PROGRAM ASSESSMENT 100

A. APPLICATION OF SPSS 100

B. SOURCES AND DESCRIPTION OF DATA 100

C. EVALUATION OF DATA 103

VII. EVALUATION OF ALTERNATIVES 117

A. EVALUATION OF QUANTIFIED FACTORS 117

B. ASSESSMENT OF NONQUANTIFIED FACTORS 121

C. PENDING LEGISLATION 126

D. RECOMMENDATIONS 127

APPENDIX A: COST AND MANHOUR DATA AND COMPUTER PROGRAM 130

APPENDIX B: EFFECTIVENESS DATA AND COMPUTER PROGRAM 157

APPENDIX C: COMPUTER TABLES AND LISTINGS 169

APPENDIX D: DATA VALIDATION COMPUTER PROGRAM 202

LIST OF REFERENCES 205

INITIAL DISTRIBUTION LIST 208

I. INTRODUCTION

This chapter begins with a brief summary of the purpose of this analysis and the methodology employed. The second section looks at the program history, objectives and various concerns that have emerged over the past decade with special emphasis on those dealing with overseas inspection. The third part of this chapter discusses the other major parties the Coast Guard interacts with in carrying out its Commercial Vessel Safety responsibilities and concentrates on some key interests of these parties.

A. PURPOSE AND METHODOLOGY

It is the purpose of this thesis to provide information and analysis which may be useful to Commercial Vessel Safety (CVS) program planners and managers regarding the inspection of U.S. flag vessels in foreign countries. The Coast Guard has historically been engaged in the enforcement of laws and regulations pertaining to maritime safety. Jurisdictional authority over U.S. flag merchant vessels is generally not constrained by the geographical area in which a vessel operates. Several overseas inspection offices were opened during the past decade in response to increasing overseas activities on the part of the U.S. fleet. Substantial participation in the offshore petroleum industry and

increased competition from foreign shipyards have greatly influenced this trend.

Closure of the CVS facilities located in Europe and the Far East in April of 1982 affected the method of conducting operations in those areas. The closures were essentially carried out as a means to expeditiously reduce operating expenses during a period of political pressure and administrative initiatives to cut the federal budget. We have been unable to find a formal analysis conducted at the time of the closures concerning changes in the comparative cost and effectiveness of inspections.

Two basic alternatives are compared in this analysis. Other possible alternatives are identified. The first alternative involves the continuation of present operations wherein all overseas activities are carried out by U.S. based personnel, travelling under temporary additional duty orders (TAD). The second alternative involves reopening the same facilities which were closed in 1982. Due to workload and the number of foreign based personnel, a major participation of U.S. based personnel remains necessary under this alternative. Under each alternative, a constant level of program personnel is assumed. A rather unique aspect of this analysis is that both alternatives have been in operation in the recent past. For this reason, actual cost and effectiveness data have been collected and compared. This

empirical orientation provides for a compelling evaluation of on-going programs.

Several factors related to effectiveness are identified. These factors include: vessel inspection quality, the availability of personnel travelling overseas, inspection consistency and cohesiveness, logistics and morale. Conceptually, the closures have raised the possibility of several problems in these areas. Of the factors identified, vessel inspection quality is considered to be more directly related to the attainment of safety of life and property goals. The effectiveness model is therefore focused on the collection of quantifiable data that is considered relevant to the measurement of inspection quality. Data samples were obtained from inspection records on file at Marine Inspection Office, New York and Marine Safety Office, Honolulu. Unequal amounts of both cost and effectiveness are anticipated for each of the alternatives. The criterion applied therefore involves minimization of the ratio of cost to effectiveness measures.

Costs that are incurred by the Coast Guard and attributable to overseas CVS activities are considered relevant to this analysis. These costs are classified under five categories: (1) overseas office operating costs, (2) incremental personnel moving costs, (3) incremental living allowances, (4) lost time to travel costs and (5) billing lag time costs. Travel and billing costs are attributable to

alternative one, the present operating mode. Costs are incurred in all five categories under the second alternative.

Data concerning overseas office operating costs were obtained from internal Coast Guard accounting reports. Figures include expenses incurred in the rental,utilities, supply and maintenance of overseas facilities. Estimates of incremental moving expenses for an overseas billet are computed as the difference between the average OUTCONUS recurring cost per billet and the average INCONUS recurring cost. These figures were obtained from 1982 Standard Personnel Cost data. Incremental living expenses include a living (COLA) and housing (HOLA) allowance paid to overseas personnel in excess of the amount paid to personnel stationed within the Continental U.S. Average per person figures used in estimating these expenses are based on actual fiscal year 1982 cost data compiled by the planning and evaluation staff under the Office of Personnel at Coast Guard headquarters. Lost time to travel costs are computed in a formula in which the sum of travel manhours, converted to manyears, is multiplied by an annual standard personnel cost for a particular rank. Data concerning TAD manhours attributed to travel are contained in the travel claims submitted by inspectors. Standard personnel costs are listed annually in Commandant Notice 7100. Billing lag time costs are computed in a formula used to estimate the cost of money that is

imputed as a result of normal administrative delays in billing customers for overseas services. A delay is defined as the number of days between the date of departure on overseas duty and the date a vessel's owner or operator pays the bill for reimbursement of travel and subsistence expenses.

The remaining sections of this chapter provide general information concerning the Coast Guard Commericial Vessel Safety program. A discussion of the literature concerning cost effectiveness analysis procedures is contained in the following chapter. Readers knowledgeable in these areas may proceed to chapter three where the formal analysis undertaken in this thesis is initiated. In addition to the formal analysis of quantified cost and effectiveness factors, a discussion concerning the significance of other nonquantified factors is included. A conclusion to continue present operations is made,in chapter seven based on the evaluation of cost-effectiveness ratios for each alternative that are arranged in a quarterly format. Several recommendations are offered, based on information gained through the analysis and the assessment of the other performance factors.

B. DESCRIPTION OF COAST GUARD COMMERCIAL VESSEL SAFETY PROGRAM

1. Program History

a. General Program

The Commercial Vessel Safety program, hereafter called CVS, is the major component of the Coast Guard marine safety mission which is the largest of the Service's regulatory functions. The CVS program drew its first breath in the early 1800's as a result of a series of boiler explosions with subsequent loss of life. This led to the enactment of the first CVS law providing for periodic inspection of the hull and boilers of steam vessels.

The early CVS or inspection laws were administered under the Treasury Department, then the Department of Commerce and subsequently transferred with the Bureau of Marine Inspection and Navigation to the U.S. Coast Guard. A 1962 U.S. Coast Guard Roles and Mission Study recommended that a single Federal Agency be designated as the prime agent for maritime safety in the United States. This recommendation was approved and the Coast Guard has performed in that capacity since.

The coverage and intensity of the CVS program has increased drastically over the years as a result of major ship disasters, public concern for maritime safety and environmental protection, and maritime safety matters being included in international agreements. Congress responded to

this concern by enacting numerous statutes to ensure the safety of U.S. vessels, their crews and passengers. This legislation, coupled with international agreements which were ratified into law, greatly enhances the size and complexity of the CVS program. Incorporating safety matters into international agreement carries the added benefit for U.S. Commerce in that U.S. Flag Carriers are not disadvantaged by foreign competition adhering to lower safety standards. The CVS program is responsible for assuring the safety of life, property and the environment in and on waters subject to U.S. jurisdiction. The operating budget for carrying out the CVS functions as noted by the Coast Guard's Roles and Missions Study of 1982 totalled $79.2 million in fiscal year 1982 or 5.7% of the Coast Guard budget.

Most of the CVS laws mandate that an activity be performed but in most cases leave the level of performance to the Coast Guard to establish. The specific level of performance is contained in the annual Coast Guard's Operating Plan. The development and enforcement of safety standards form the benchmark for the level of Coast Guard performance. The Coast Guard's Marine Inspection Offices (MIO's), Marine Safety Offices (MSO's) and their designated subunits are the operating units which enforce the laws and regulations. In 1980, there were 43 Marine Safety Offices, 6

Marine Inspection Offices and 3 overseas marine inspection activities.

b. Overseas Program

The approval of a vessel's plans and initial inspections are the primary tools used by the Coast Guard for enforcing safety standards. Not performing plan review and initial inspection would place the burden of exposing any inherent unacceptable safety compromise due to design, improper material construction or equipment installation on the periodic in-service inspection or on failure in operation. Such a system most likely would result in catastrophe or at least involve substantial remedial costs. This concept is of vital importance in the context of Commercial Vessel Safety and should be pursued whether the construction of U.S. vessels is undertaken at home or abroad. Rear Admiral Clyde T. Lusk, current Chief, Office of Merchant Marine Safety, indicated his views during a personal interview in July of this year, by stating: "U.S. Flag Vessels under construction in foreign shipyards should receive the same attention given to those vessels built in the United States."

Beginning in the 1970's the Coast Guard began permanently assigning personnel in certain overseas locations to carrry out Commercial Vessel Safety activities. Offices were established in Guam, Kobe, Japan, Singapore and Rotterdam, Netherlands. These offices cover new construction

conversions and periodic inspections in Europe, Africa, the Middle East and the Far East. The overseas program generally consisted of marine safety personnel attached to the U.S. Embassies in the particular areas with the exception of some brief temporary additional duty (TAD) inspectors responding to an increase in overseas workload.

In April, 1982, as a result of significant budgetary restraints, the overseas offices in the Netherlands, Japan, Singapore and Guam were closed.

> "Closure of these offices were effected during FY 1982 in order to realize personnel and dollar savings. The intent in closing these overseas offices was not for the purpose of giving up our overseas inspection program, but rather to markedly change the way we do it." (Commercial Vessel Safety Operating Plan,FY 85-94, U.S.C.G.)

Public Law 96-376 also played a significant role in the decision to close the foreign offices. Public Law 96-376 granted the Coast Guard statutory authority to require owners to reimburse the Coast Guard for travel and subsistence expenses incurred for overseas inspections and examinations.

The workload and area of responsibility of the closed offices were transferred as follows:

MSO Honolulu____Inspection activities in the Far East, Pacific Basin, Indian Ocean as far as the Arabian Sea.

MIO Seattle________Inspection activities in Western Canada.

MSC San Diego_____Inspection activities in Western Mexico above 20 degrees North latitude.

MIO New Orleans___Inspection activities in South and Central America, Western Coast of Mexico below 20 degrees North latitude.

MIO New York______Inspection activities in Europe, Red Sea, Mediterranean Sea, Arabian Sea, Persian Gulf, and all of Africa.

MSC Boston________Inspection activities in Eastern Canada.

(Federal Register/VO147,NO55/Monday, March 22,1982)

There still remains a heavy demand for CVS services in the foreign arena. Several factors account for this demand. The continuing search for increased sources of petroleum and the discovery of the North Sea fields has produced a sizeable U.S. maritime presence based overseas. These vessels are not returning to the U.S. for required safety inspections. Another factor involves the keen competitive structure of the foreign shipyards in relationship to U.S. shipyards for similar construction and/or repairs.

2. Program Objective

Marine Safety is one mission of the Coast Guard. The intent of this mission has been to benefit society as a whole, even though there are some benefits which accrue specificially to the owners, operators and crews of the vessels. The mission has historically been funded in the

form of general tax revenues. CVS is a program within that mission and vessel inspection is a function of that program.

The objective of the Commercial Vessel Safety program as outlined by the Coast Guard in testimony in 1981 before the Subcommittee on Coast Guard and Navigation, U.S. House of Representatives, is stated as: "the prevention of deaths, personal injuries, and property loss associated with vessels and other facilities engaged in commercial or scientific activity in the marine environment."

The objective is pursued, as noted in the 1982 Coast Guard's Roles and Mission Study, through the administration of the following functions:

a) Review and approve new vessel construction plans to ensure that the vessel is of seaworthy design and in keeping with Federal construction standards;

b) Periodically inspect vessels to ensure that they are being maintained and repaired properly, carry proper lifesaving equipment and in general remain seaworthy;

c) License and certificate the personnel that operate U.S. vessels to ensure that they are competent, trained, and physically qualified to serve at sea;

d) Investigate marine casualties to establish the cause of the casualty, recommend remedial procedures to limit their reoccurence, and, if necessary recommend punitive action against personnel in violation of U.S. maritime law; and,

e) Admeasure and document U.S. vessels to facilitate their use in international trade and provide evidence of ownership for identification and financial relationships.

3. Problems and Concerns with the Program

Several studies were undertaken in the late 1970's as a result of:

a) Several major marine casualties resulting in loss of life and property and environmental damage in or near U.S. waters,

b) Greater concern voiced by the public for ecological and cost consideration,

c) Greater Congressional interest in the effectiveness of Coast Guard resources allocation.

A study which drew a significant reaction from the Coast Guard and the maritime industry was the General Accounting Office Report titled "How Effective is the Coast Guard in Carrying Out Its Commercial Vessel Safety Responsibilities?" dated May 25, 1979. The study indicated that the Coast Guard should make improvements in the following areas of the CVS program:

1. Expand in-house training, establish standards for qualifying inspectors, establish an inspection job classification, and extend the inspectors' tour of duty.

2. Reexamine the possibility of transferring some aspects of the U.S. vessel inspection program to the American Bureau of Shipping.

3. Provide comprehensive direction for boardings and examinations, improve follow-up on tankship safety deficiencies, expedite the development of the Marine Safety Information System, adopt an aggressive penalty policy, and emphasize the boarding and examination of uninspected U.S. Commercial vessels.

4. Require a demonstration of competency for issuance or renewal of marine industry personnel licences, establish medical standards for determining the physical fitness of maritime personnel, seek jurisdiction over state pilots and abolish the shipping commissioner functions.

5. Study the staffing needed to carry out activities in the Coast Guard's commercial and international safety activities.

The Coast Guard rejected several broad indictments but was in substantial agreement with the study's basic tenets. The idea of delegation of services continues to be an issue concerning inspection functions of the CVS program. "The most prominent question which emerged during the Subcommittee's Oversight hearing was whether or not some of the functions now being performed by the Coast Guard can be undertaken with equal competence and at less cost to the Federal Government by classification societies such as the American Bureau of Shipping or similar U.S. organizations."

(Subcommittee on Coast Guard and Navigation, U.S. House of Representatives, November 1981)

A particular benefit of a non-governmental agency is that costs will be borne by the private sectors. Another strength is that inspections now performed by non-governmental entities will not be duplicated by Federal inspections except on a spot-check basis.

A weakness of involving a non-governmental agency in the enforcement of laws and regulation is the potential for conflict of interests. Another weakness is the lack of enforcement authority of non-governmental organizations and the lack of control by the Federal agency which is ultimately responsible for enforcement.

Studies and Congressional hearings similar to the ones named, especially during times of strongly perceived budgetary constraints, and initiatives to minimize regulatory impact will continue to require critical review of traditional legislatively mandated CVS functions.

C. OTHER PARTY INTERESTS

There are many organizations in both the Federal and private sectors that have an impact on the U.S. maritime industry and in particular the Commercial Vessel Safety program. These organizations and the Coast Guard interact over a wide range of functions. This interaction influences all sectors of the industry such as the financial

institutions which provide capital for ship construction; the marine insurance industry, classification societies, cargo bureaus, standard setting organizations which provide a basis for quality control; the maritime training and education establishment and the great variety of businesses which build, maintain, supply and operate vessels.

This section will describe briefly several organizations that have a more pervasive impact.

1. <u>The American Bureau of Shipping</u>

The American Bureau of Shipping (ABS) was created in 1862 by the New York Legislature as a non-profit, international ship classification society. ABS has a primary function of certifying the soundness and seaworthiness of merchant ships and other marine structures. ABS is entirely supported by the fees charged to shipowners who request classification services. Just as the Coast Guard sets vessel safety standards to meet national safety objectives, ABS sets standards, known as rules for the purpose of placing a vessel in class, principally for gauging its insurability.

As of June 1983, there were 15,580 vessels totalling approximately 191,076,014 deadweight tons under classification by ABS. The society is represented in 94 countries with a work force of 1655 exclusive employees, in 140 exclusive offices worldwide. An exclusive employee is one who works full time for the organization.

A strong driving force has emerged in the past several years for transferring or delegating some functions of the CVS program to ABS. This force led to the passage of Public Law 97-136 which provides authority for the Coast Guard to delegate vessel inspection or examination duties to the American Bureau of Shipping or similar American Classification Society to the maximum extent practicable. It should be noted that ABS is the only American classification society currently chartered in the United States. This law further provides specific authority for the Coast Guard to utilize ABS or a similar American classification society for review and approval of vessel hull, machinery, piping and electrical plans.

Discussion between ABS and the Coast Guard resulted in a Memorandum of Understanding (MOU) dated June 9, 1981, which addressed the basic guidelines for cooperation, plan review and inspection of vessels under construction which are to be classed by ABS and certified by the Coast Guard. This MOU, which is referred to as MOU I, was relatively limited in scope but served as a useful tool for further discussions and agreements resulting in a second MOU (MOU II).

MOU II, dated 27 April 1982, superseded and expanded upon MOU I by providing for further areas of plan review and Coast Guard acceptance of inspection tasks associated with construction of new vessels and major conversions built to ABS classification rules and certified by the Coast Guard.

MOU II also provided instruction to the industry on plan submittal procedures, areas of responsibility between ABS and the Coast Guard and provisions for Coast Guard oversight and general administration.

The Coast Guard initially projected a 15.5% reduction in new construction workload resulting from the MOUs. It is felt that a reduction occurred but not of the magnitude initially projected. At present, the actual effectiveness of the delegation of services to ABS has not been evaluated as noted in the required Annual Report to Congress concerning such delegation.

> "Since implementation of Mou I (1 August 1981) and MOU II (June 1983), 663 vessels have come under the term of the agreements. During this period 422 vessels were completed under one of the MOUs. A comparison of Coast Guard man-hours devoted to vessels coming under plan review and inspection guidelines of the MOUs and those entirely under Coast Guard inspection presently does not provide meaningful information. Efforts will be made to track man-hours and the impact of the MOUs on Coast Guard technical and inspection resources and costs, and compare them with the certification program involving vessels not classed with ABS. (Annual Report to Congress, G-MP/24, U.S. Coast Guard, June, 1983)

The report also noted that the Coast Guard is moving hesitantly concerning the delegation of other services.

> "As to ABS performing vessel inspection and re-inspection functions other than at new construction, we considered this to be a very long term option which will require further negotiations and considerable discussion. We currently do not support this additional delegation since the present MOUs have not been fully implemented to the extent possible, nor have we determined the true benefits/ costs of the on-going program. (Annual Report to Congress,G-MP/24, U.S. Coast Guard, June 1983)

2. Other Federal Agencies

"Other Federal agencies such as the Maritime Administration (MARAD) and the Occupational Safety and Health Administration (OSHA) also perform inspections and review certain safety aspects for vessels. MARAD has the role of owner/financier/promoter for vessels it subsidizes, while OSHA oversees the work place environment. For many maritime issues, Coast Guard regulations directly affect employee working conditions and thereby preempt OSHA's standards for these same conditions." (Coast Guard Roles and Mission Study, 1982)

MARAD requirements to inspect U.S. flag vessels are related only to compliance with construction constraints involving the construction differential subsidy and the inclusion of national defense design features.

The International Maritime Organization (IMO), formerly named Inter-Government Maritime Consultative Organization, was established in 1958 under the auspices of the United Nations. It has served as a focal point for international deliberation on marine safety since that time. IMO has expanded to 121 member countries from the chartered 21 members.

The Coast Guard has been officially delegated to represent the U.S. interest in IMO since its inception. CVS program personnel participate at all levels of the organization.

3. The Maritime Industry

a. Shipping Companies

The U.S. shipping industry is a very complex industry which consists of many segments, each structured

differently. The privately-owned U.S. fleet is divided according to whether a shipping firm is engaged in international ocean shipping or in lakes, rivers, coastwise or intracoastal domestic shipping. These areas are more commonly referred to as engagement in foreign or domestic trade respectively. U.S. ocean shipping is further divided by mode of operation, namely liners or tramps. Domestic shipping is classed geographically according to the area of operations; Great Lakes, rivers, coastwise, or intracoastal shipping.

A primary concern for the shipping companies is the extent to which the burden of CVS regulation can be passed on to the consumer. In the Maritime Administration Study dated December 1979, cost of compliance with Federal regulations were estimated to be approximately one percent of total construction and operating cost.

There is a distinct difference in the market structure facing the foreign and domestic trade sectors. In the foreign trade, U.S. vessels (documented vessels of the United States) must compete with foreign and U.S. firms operating ships registered in foreign countries and manned by non-U.S. crews. In the domestic trade, only U.S. vessels are allowed to participate. CVS regulation, with its main focus on safety, should not add a crippling cost disadvantage on the U.S. Ocean fleet.

b. Shipyards

The vigor of U.S. commercial ship building and repair yards rests heavily on the strength of the nation's Merchant Marine and the Government policies on the size of its public fleet (i.e. Navy, Coast Guard, and U.S. Army Corps of Engineers).

> "Shipbuilding and repair activities are under extreme and constant pressure from highly competitive foreign shipyards, which offer to build vessels at extremely low prices with assurance of support from their governments. Based on this government support, and to ensure their survival during this time of depression, overseas yards are quoting prices on construction of new ships at 20 to 40 percent below actual costs. This places an awesome burden on U.S. shipbuilders competing in a worldwide market." (Critical Issues in Maritime Transportation, 1981)

This pricing strategy has tended to increase the Coast Guard workload in overseas inspections.

> "In 1979, two major U.S. ship operators signed letters of intent or contracts with Japanese or Korean shipyards for construction of 24 large containerships at an average cost of about $33 million each. It is expected that the total cost of these vessels if contracted for in the U.S. yards would have been not $800 million, but two and one half times-to-three times that amount. During 1979, at least one major U.S. shipyard closed its doors on shipbuilding, leaving a 225,000-ton tanker and a number of other vessels incompleted." (Critical Issues in Maritime Transportation, 1981)

The particular cases noted above led to the establishment of Marine Inspection Office, Kobe, Japan, in the fall of 1979.

It is projected in the CVS operating program for FY 85-94 that a major shipping bill will pass Congress in the near future. In addition to providing a framework for the

revitalization of the American Merchant Marine, it is likely that this bill will increase the foreign construction of American flag vessels.

II. COST EFFECTIVENESS ANALYSIS PROCEDURES

A. INTRODUCTION

This chapter will focus on procedures and tools used in the area of cost effectiveness analysis. Anyone attempting to conduct a study of this nature should first have a working knowledge of the theory involved so a plan of attack can be devised that will produce valid results that are acceptable to users of the information. "Too often, the tendency is to plunge directly into gathering data and estimating benefits and costs with the hope that it will all fit together at the end. In an undertaking as complex as CBA, this is not a wise course. Much effort is wasted and much remains undone when precise plans do not guide the analysis." (Sassone, Schaffer, 1978) Since our thesis deals with the analysis of a government activity, we will often concentrate on the applications of theory in this area.

1. Definitions

Several terms are used in the literature to label analysis of this nature. They include cost benefit analysis, cost effectiveness analysis, economic analysis, performance evaluation, policy analysis and systems analysis. There appears to be wide-spread disagreement among authors and

theorists regarding the definition of these terms and the placement of appropriate theoretical boundaries between them.

> "Numerous other terms--operations analysis, operations research, systems engineering, cost utility analysis--might also be used, depending on the context, and, to different people, they might imply some subtle distinction. But they all convey the same general meaning. Moreover, there exist among them no distinctions in principle. Whatever differences may be found are simply matters of degree, emphasis, and context. What is important, therefore, are the characteristics they have in common. These include an effort to make comparisons systematically in quantitative terms, using a logical sequence of steps that can be retracted and verified by others." (Quade, 1967)

In his introduction to Cost-Effectiveness Analysis, author Edward S. Quade defines and analysis as one involving a comparison of alternative courses of action in terms of their cost and their effectiveness in attaining some specific objective. For the sake of consistency, we will continue to use the term cost-effectiveness in referring to this area of analysis.

2. Steps

The basic steps involved in a cost-effectiveness analysis include: a definition of the problem at hand and the objective of the analysis, a listing of alternatives, a means or criteria of choice used in evaluating the alternatives, the determination of costs and benefits of each alternative and the evaluation of the alternatives based on the criterion selected. Each of these will be discussed in the following sections of this chapter. These basic steps are normally included in an analysis but the form and content of each may

differ greatly due to the wide range and scope of problems addressed.

B. PROBLEM DEFINITION

1. The First Step

The first major step in undertaking a cost-effectiveness analysis is to define the problem at hand and to state the objective of the analysis. In _The Decision Maker's Handbook_, author Alexander H. Cornell states that the existence of a bona-fide problem is necessary before a decision (with or without the aid of analysis) can be made.

> "Within any system or subsystem structure, a condition must exist that presents a decision maker with the opportunity to make a decision. Additionally, the situation should offer alternative courses of action to resolve the decision situation. Again it is appropriate to repeat an earlier observation: if there is no decision-making situation there can be no decision, no alternatives. ...At the other extreme, it is good to remember that a decision not to make a decision even where a decision situation exists is a decision in itself." (Cornell, 1980)

In many cases, the decision maker or user of the information and the analyst or provider of the information are not the same person. In these situations, the definition of the problem involves communication between the decision maker and the analyst as to what constitutes the problem. "The decision maker's input to the analyst will affect the analyst's output to the decision maker. The better the problem is specified, the more useful will be the final report to the decision maker." (Sassone, Schaffer, 1978)

Following the excerpt, authors Peter G. Sassone and William A. Schaffer then explain that this first step provides direction for the remainder of the analysis. "It is here that the decision maker plays a crucial role, communicating to the analyst precisely what he wishes to be done. It is the analyst's task to record these desires, and elicit whatever information is needed to exactly define the problem. While each project has its own unique features, many aspects of problem definition are common to most, and , although such a listing can never be complete, it forms a basic checklist for both the analyst and the decision maker." (Sassone, Schaffer, 1978)

2. Applications

Analysis, as stated in the preceding section, can be applied over a wide range of problem situations. In Analysis for Public Decisions, author Edward S. Quade lists four major applications of analysis pertaining to governmental programs. "Analyses are needed for such tasks as: (1) fairly routine evaluations of ongoing or proposed programs or projects with a view to changing the resource allocation or to improving operations with the same allocation; (2) comparisons of the costs and benefits of proposed programs; (3) the investigation of special issues or problems not associated with proposed or established programs but which someone inside or outside the government brings to notice; and (4) detailed preparation of new programs." (Quade, 1975) This

inherent diversity in applications reinforces the importance of a rather precise problem definition pointed out in the preceeding paragraph. This is not to say that once a problem has been defined it cannot be altered, refined or updated at some point during the analysis. The approach taken is often described as an iterative process.

3. Assumptions

A final point that relates to the problem definition stage concerns assumptions which are also related to the entire process. In the following excerpts, author Alexander H. Cornell describes the use of assumptions in an analysis.

> "Assumptions are not only embodied in the formulation phase, they are necessary throughout the entire analytic study. ... Assumptions are used to limit the scope of a problem or opportunity, and to limit the scope of objectives and alternatives. Care must be exercised in this last application, for unduly restrictive assumptions will rule out some potentially significant objectives or alternatives. ...The best guide is to try to limit assumptions to those areas in which it simply is not possible to obtain facts. This last problem is greatly affected by resources and the time to gather information." (Cornell, 1980)

Cornell also points out that assumptions are inevitable, that they should be reasonable and that they be explicitly identified within the analysis.

C. LISTING OF ALTERNATIVES

Once the problem has been specified and defined, various alternatives or possible solutions are sought and identified. The number and diversity of alternatives are often influenced

by the nature of the problem, which, according to Sassone and Schaffer, takes one of the following three forms: (1) one project is to be accepted or rejected, (2) one of several projects is to be accepted, (3) several of many projects are to be accepted. The analyst's abilities and available resources also influence the quality and quantity of alternatives.

In <u>Analysis for Public Decisions</u>, Edward S. Quade offers the following comments concerning the search for alternatives.

> "The generation of alternatives is, or should be, a creative act. ...Genuinely new alternatives are hard to come by simply because it is very difficult for the human mind to think of things someone has not thought of before. ...The process of searching for alternatives also includes a certain amount of evaluation, for in so doing the grossly inferior ones are implicitly screened out by simple tests for dominance or acceptability. Sometimes these tests are based more on similarity to alternatives found acceptable in the past than on estimates of their actual effectiveness. This is simply a reflection of the fact that similarity is often an efficient screening device. Possibly too much so; it is seldom that a radically unfamiliar alternative will appear useful because the screener, with coordination in mind, will tend to eliminate an alternative that does not appear to fit in with other areas of his organization. The familiar alternatives that change only incrementally have at least that virtue of fitting within the organization." (Quade, 1975)

Alexander H. Cornell identifies several potential sources of alternatives, each having a varying degree of analytic ability. These include someone with intuition, and expert, a group of experts and a committee. Other methods of obtaining alternatives include brainstorming, the Delphi technique and modeling. Even though arguments can be made for or against any of these sources or methods, they may be useful in

obtaining a workable set of alternatives. The number of alternatives should be manageable. This depends on the scope of the problem and the resources available for solving it. There is always the possibility that the theoretically "best" alternative was never uncovered and therefore was not chosen as the solution.

D. CRITERIA OF CHOICE

During this stage of the analysis, the criterion or decision rule to use in selecting an alternative over others is specified. There are two main levels at which criteria are applied, depending on the scope of the problem. One generally involves social or governmental decisions at the microeconomic level while the other is applied in less far reaching decisions at the organization or sub-organization level.

1. Economic Efficiency

The first and more general level involves the concept of economic or allocative efficiency. Economic efficiency exists within an economic system when it is impossible to increase general welfare with a given amount of resources and level of technology. Static efficiency is the term used for economic efficiency within a short time span where resources and technology are fixed. The term dynamic efficiency applies to an extended period of time where resources and technology are allowed to vary. "Economists, one might

think, could simply apply the optimization principle to the economy's present allocation of resources and goods: they could ask themselves whether the marginal benefit of any potential reallocation of resources or goods just equaled the marginal cost. If this marginal benefit did not equal this marginal cost, the present allocation would not be the best one." (Kohler, 1982) Unfortunately, this is not an easy process to undertake.

Economist Vilfredo Pareto was a pioneer in developing the concept of economic efficiency. He established a number of marginal conditions that should be met for a system to achieve economic efficiency. "If a reallocation of resources or goods left some individuals, in their own estimation, equally well off but others better off, social welfare had increased. If some felt equally well off but others worse off, social welfare had decreased. If some were better off and others worse off, the situation could not be evaluated by economic science-unless, that is, the gainers actually compensated the losers to the losers' full satisfaction and were still better off." (Kohler, 1982) Closely related to the Pareto conditions is the Kaldor-Hicks principle. This less stringent indicator of economic efficiency is referred to by author Edward M. Gramlich in Benefit-Cost Analysis of Government Programs. "The Kaldor-Hicks principle is that situation A is preferred to situation

B if the gainers could compensate the losers and still be better off. Notice that the Kaldor-Hicks principle does not require that the gainers actually do compensate the losers and so does not deal with the distributive consequences of policy changes." (Gramlich, 1981) Although the concepts of economic efficiency are theoretically preferred in the evaluation of projects or alternatives affecting general public welfare, practical application is usually difficult. Often a somewhat more specific criterion will be applied.

2. Lower level Criteria

The second level of criteria normally is applied in analysis at the organization level and in making decisions concerning programs at the agency level in government. There are three general criteria which are normally used. "The analyst may rank alternatives by one of three general criteria. These criteria conform to the three basic types of cost/benefit relationships: Unequal Cost/Equal Effectiveness, Equal Cost/Unequal Effectiveness, and Unequal Cost/Unequal Effectiveness. The three criteria are: (a) Least cost for a given level of effectiveness, (b) Most effectiveness for a given cost constraint, (c) Largest ratio of effectiveness to cost." (D.E.A.C., 2nd Ed.) There are also several criteria that are used to evaluate projects from a financial perspective. These include net present value, internal rate of return and payback period and are normally applied when

the costs and benefits of a project are more easily quantified in monetary terms.

E. DETERMINATION OF COSTS

There are several perspectives which may be taken in the process of determining the costs of the various alternatives. Each may be preferred under different circumstances. These perspectives include: (1) static costing and time phased costing, (2) incremental costing and (3) life-cycle costing.

1. Static and Time Phased Costing

Static and time phased costing methods are discussed by author Harry P. Hatry in "The Use of Cost Estimates." In this contribution, he states that static cost analysis is normally applied in system configuration or system comparison study and the costs commonly take one of the following three forms: (a) acquisition cost plus operating costs for a specified number of years, (b) acquisition cost less residual value plus operating costs for a number of years, (c) either of these two forms discounted to the present. Time phased costing typically takes one of these forms: (a) annual funding requirements, (b) cumulative funding requirements, (c) either of the two streams discounted to the present. This method is often applied in budgeting, particularly in the public sector. "To the extent that such considerations exist as annual funding constraints or the desirability of smoothing out annual funding, then the

display of the annual funding requirements will be of importance to planners. (As a practical matter, the major interest of Government planners is, of course, in the current and next budget years' requirements.)" (Hatry, 1967)

2. <u>Incremental Costing</u>

The incremental costing approach is not entirely independent from the methods already mentioned. This approach is commonly used in capital budgeting decisions in the area of managerial accounting. It is also related to the concept of marginal costing and the problem of deciding which cost are relevant.

> "Cost analysis, like systems analysis which it serves, can be viewed as an application of the economic concept of marginal analysis. The analysis must always move from some base that represents the existing capability and the existing resource base. The problem is to determine how much <u>additional</u> resources are needed to acquire some specific <u>additional</u> capability, or, conversely, how much <u>additional</u> effectiveness would result from some <u>additional</u> expenditure. It is, therfore, the incremental cost that is relevant. Sunk costs are not included, and inherited assets are not costed." (McCullough, 1967)

Edward S. Quade points out that some costs may not be considered relevant for another reason that pertains to whether costs are considered internal or external.

> "Costs may be relevant but they may not concern us. For example, costs falling upon hostile nations may not concern us in the same way as costs falling upon our own population. External costs are those costs of a program or decision that fall outside the boundaries of the decision maker's interest or beyond the scope of his organization. Whether a given cost is internal or external thus depends on where in the decision-making hierarchy the decisionmaker happens to be and how comprehensive his concern." (Quade, 1975)

3. Life-Cycle Costing

Following his discussion conerning incremental costing, author James D. McCullough also comments on the perspective of life-cycle costing in his contribution "Estimating Systems Costs." It is related to the time phased costing approach in that it attempts to measure a program's total cost impact over time. "Life-cycle costing results from the principle that the funds necessary to undertake a program are not the primary consideration, nor are the funds required in any particular time period, but a decision to undertake a particular course of action should take into account its total cost impact over time. The cost of developing the system must be accounted for, and the cost of procuring the system, and also the cost of operating it as a component of the force, must be taken into consideration." (McCullough, 1967)

4. Choosing a Discount Rate

To conclude this section, some attention to the choice of interest or discount rate applied in accounting for the cost of money is necessary. Several rationales concerning the choice of an appropriate rate exist and, as noted in the following excerpts, there has been no particular method that is universally accepted. "The Department of Defense currently has a 10% discount rate established by DoDI 7041.3

to be used in all economic analyses of proposed Defense investments." (D.E.A.C., 2nd Ed.) "The rationale behind the discounting process is to allow for differences in the timing of cash flow, but not for risk, and this argues for the use of a risk free or time preference interest rate. The obvious problem here is the definition and identification of a 'risk free' rate of discount." (Corti, 1973) "But, in fact, knowing what rate to use is quite a trick, one that has taken the attention of literally hundreds of economists over the past 30 years." (Gramlich, 1981) The use of judgement in the choice of a proper discount rate has led Dr. Nicholas A. Ashford to offer the following words of caution concerning regulatory decision making. The comments, however, also apply elsewhere. "Further, since the consequences of many regulatory actions may be to impose compliance costs today in order to bring about health benefits far into the future, the choice of discount rate can make one regulatory option look better or worse than an alternative. Since there is no consensus on what that rate should be, the policymaker's preference for a particular regulatory option can be hidden in the choice of a discount rate." (Ashford, 1980)

F. DETERMINATION OF BENIFITS

The next step involves identification and measurement of the benefits of the various alternatives. Most people dealing with this subject agree that measuring effectiveness

is normally more difficult than measuring costs, especially in nonprofit, government or service oriented programs or projects. In their article for The Accounting Review, authors James E. Sorensen and Hugh D. Grove point out that the literature in this area is somewhat lacking. "A widespread literature focused upon profit-oriented organizations has left the accounting literature with few operational techniques which are responsive to nonprofit service performance evaluations."(Sorensen, Grove, 1977)

In "Organizational Effectiveness: Some dilemmas of Perspective," author Robert Dubin indicates that a dichotomy exists between the use of operating efficiency and output effectiveness measures. "This distinction between social utility of output and operating efficiency is one that pervades the economy. The counterpoint of internal efficiency and social utility of output is so fundamental that almost all contemporary social problems involving organizations can be analyzed from the standpoint of this dilemma. Indeed, whenever an organization comes under attack from the outside, its leaders will defend it on grounds of organizational effectiveness quite opposite from those used as the basis of the attack." (Dubin, 1976) In his contribution titled "Measures of Effectiveness," William A. Niskanen offers two necessary characteristics of an effectiveness measure.

"The choice of these measures is the most difficult, unique problem of cost-effectiveness analysis. The appropriate measure should have two characteristics: First, and most important, it must be relevant; preferable, but less important, it should be measureable. These objectives are often conflicting. The most relevant are often very difficult to measure and vice versa. The analyst's first challenge, therefore, is to choose a better combination of relevance and arithmetic than that exhibited by most politcal strategists, and, for that matter, by all too many operations analysts." (Niskanen, 1967)

Probably one of the most widely respected authorities concerning management of nonprofit organizations is Dr. Robert N. Anthony. In his text Management Control in Nonprofit Organizations done in collaboration with Professor Regina E. Herzlinger, the distinction between efficiency and effectiveness measures is more reconciliatory than that proposed by Professor Dubin. They also point out the difficulty in making such measurements.

"Output information is needed for two purposes: (1) to measure efficiency, which is the ratio of outputs to inputs (i.e.,expenses); and (2) to measure effectiveness, which is the extent to which actual output corresponds to the organization's goals and objectives. In a profit-oriented organization, gross margin or net income are measures that are useful for both these purposes. In a nonprofit organization, no such monetary measure exists because...revenues do not reflect true output in the same sense as a profit-oriented company. ...In the absence of a profit measure, neither efficiency nor effectiveness can be analyzed unless an adequate nonmonetary substitute can be found." (Anthony, Herzlinger, 1980)

In their text, they define three basic measurement categories which may be used in the area of nonprofit or service oriented activities. The first are called results measures. "A results measure is a measure of output expressed in terms that are supposedly related to an

organization's objectives. In the ideal situation, the objective is stated in measurable terms, and the output measure is stated in these same terms. When this relationahip is not feasible, as is often the case, the output measure represents the closest feasible way of measuring the accomplishment of an objective that cannot itself be expressed quantitatively. Such a measure is called a surrogate or a proxy." (Anthony, Herzlinger, 1980) The second is called a process measure. "A process measure relates to an activity carried on by the organization. ... The essential difference between a results measure and a process measure is that the former is ends-oriented, while the latter is means-oriented. An ends-oriented indicator is a direct measure of success in achieving an objective. A means-oriented indicator is a measure of what a responsibility center or an individual does." (Anthony, Herzlinger, 1980) The third type of measure is called a social indicator. These are often applied when a program or project is being evaluated from the standpoint of economic efficiency discussed in the section regarding criteria. "A social indicator is a broad measure of output which is significantly the result of the work of the organization. Unfortunately, few social indicators can be related to the work of a single organization because in almost all cases they are affected by exogenous forces, that is, forces other

than those of the organization being measured." (Anthony, Herzlinger, 1980)

The literature brings out two important points: that there are several means which may be used in measuring benefits; and that one normally encounters difficulty in any means applied. The analyst's choice of method normally will involve judgement with regard to applicability, convenience and availability of data.

G. COMPARISON OF ALTERNATIVES

1. Purpose of Evaluation

Once the costs and benefits of the alternatives have been identified, measured and recorded, a comparison or evaluation of the alternatives can be performed. The final outcome is a choice or ranking of the alternatives under the guidelines specified in the criterion for doing so. In the chapter of Analysis for Public Decisions which deals with evaluation of government programs, Quade applies the term evaluation as a means of measuring the accomplishments of an on-going or sometimes completed program in comparison to anticipated results. Such evaluations are used to propose changes in resource allocation, to improve operations and often aid in planning future activities. This type of evaluation directly pertains to the subject matter of this thesis.

a. Evaluation To Affect Resource Allocation

"Evaluation to affect resource allocation is designed to assess the worth or effectiveness of an on-going program or project in order to help determine the funds (or possibly other resources) it should be assigned. It sometimes involves a choice between using funds to continue or to end a program, but more often the decision is resource allocation at the margin--adding a little to the programs that seem to be doing well and cutting back, or not increasing, the others." (Quade, 1975)

b. Evaluation To Improve Operations

"Evaluation to improve operations is frequently done internally since its purpose is to investigate possible changes in the program with a view to improving performance, not to see how the program is doing in comparison with similar programs or in any absolute sense." (Quade, 1975) He further states that the type of data used in this area of analysis is often low-level, routine and short-range in nature.

2. Techniques

In their work Practical Program Evaluation for State and Local Governments, Harry P. Hatry and his associates offer five approaches to program evaluation. These are:

a. Before vs. after program comparison.

b. Time trend projection of pre-program data vs. actual post-program data.

c. Comparisons with jurisdictions or population segments not served by the program.

d. Controlled experimentation.

e. Comparisons of planned vs. actual performance.

The method of evaluation applied may be specified within the problem statement as a mandate of the decision maker or, again, it may be outlined in the criteria. When the choice is made by the analyst, it usually depends on the type of problem to be analyzed and the influence of time and resource constraints.

3. Guidelines

With regard to preferred evaluation techniques, and while drawing from the works of other contributors, Sorensen and Grove offer the following research quidelines.

a. The results of the program should be observable.

b. In any comparison of populations, samples must be created by random or systematic allocation of individuals to groups.

c. Analysis of improvements of a specific target group must be supported by comparison with similar groups which may have received different interventions.

d. Evaluation instruments must be assessed for reliability, especially for inter-rater agreement, for validity.

e. Observed differences are often small. New programs usually create only modest effects and large 'slambang' effects will be few.

When a comparison of alternatives is actually conducted, the use of a graphic format is recommended by the Defense Economic Analysis Council in their publication titled Economic Analysis Handbook.

> "The proposed method of comparison of alternatives employs a graphic format. It should be emphasized that graphic analysis is not necessarily a substitute for mathematical calculations which rank the proposals. Rather, this format serves to display the results of computations in a manner which is easily understood when we have a continuum of cost and effectiveness measures. Using graphs serves two functions. First, the graphs may suggest the appropriate ranking of the alternatives over a given range of time or effectiveness, thus performing an analytic function. Second, the use of a graph allows the decision maker to see at a glance all the information which may become lost in a tabular maze." (D.E.A.C. 2nd Ed.)

This format is inherently helpful in the process of sensitivity analysis because, as mentioned, the alternatives may be compared graphically over a given range of one or more variables.

4. Sensitivity Analysis

Sensitivity analysis is, in itself, an important part of the cost effectiveness analysis process. It provides information of a dynamic nature to both the analyst and the decision maker on the acceptability of the alternatives. In the following excerpt, author G. Corti explains the use of sensitivity analysis in a financial investment context. Like

breakeven analysis, it is often helpful to display sensitivity analysis in a graphic format.

> "Sensitivity analysis is a desirable first step in the appraisal of risk and uncertainty. As is well known, this is a method of testing the sensitivity of the merit of an investment. It involves revising estimates of uncertain assumptions and variables and ascertaining how such revision affects the expected profitability of a project. The idea is that management must become aware of the financial consequences of all likely outcomes before being able to make a reasoned evaluation of the worth of a project." (Corti, 1973)

5. <u>The Final Report</u>

To conclude an analysis, the analyst conveys his or her findings and recommendations to the decision maker by submitting a report. The final report is, of course, the end product of the analysis. It documents and communicates the work done by the analyst to the decision maker. It should therefore contain a logical representation of the analysis performed and provide understandable findings. The report should also be detailed and complete.

> "'Documentation' is essential. If numbers are arrived at or critical sources used, then by all means document the work already laboriously done. The time spent in having numbers, equations, models, or judgements which have been omitted from a report explained fully to a manager is one of the most wasteful kind of 'drills', about which I know only too well. Endless hours of discussion and clarification can be avoided by including them." (Cornell, 1980)

H. PROBLEMS AND CONCLUSIONS

1. Problems in Cost Effectiveness Analysis

Before concluding on the subject, we consider it appropriate to discuss some of the more common problems or misgivings concerning cost effectiveness analysis. These include: (a) time and resource constraints, (b) the presence of judgement, (c) quantifiability of factors, (d) political constraints, and (e) uncertainty.

a. Time And Resource Constraints

The effects of time and resource constraints pervade an analysis. These constraints greatly affect the validity and completeness of information used within the analysis. They also may result in the use of judgement which poses a problem in itself.

> "Time money and other costs obviously place severe limits on how far any inquiry can be carried. The very fact that time moves on means that a correct choice today may soon be outdated by events and that goals set down at the start may not be final. This is particularly important in public policy analysis, for usually the decision-maker can only wait a very limited time for an answer. The costs of delay may be of more consequence than the benefits of further inquiry because the time at which the decisions can be made successfully may pass rapidly." (Quade, 1975)

b. The Presence of Judgement

"Human judgement is used in designing the analysis, in deciding what alternatives to consider, what factors are relevant, what the interrelations between these factors are, and what numerical values to choose, and in interpreting the results of the analysis. This fact--that

judgement and intuition permeate all analysis--should be remembered when we examine the results that come, with apparent high precision, from analysis." (Quade, 1967) Whenever judgement is used, there is also the possibility that either willful or unconscious bias may be present.

c. Quantifiability Of Factors

Professor Alan Williams uses the following comments to answer the question: Is cost benefit analysis precise? "...such is the strength of the influence of the scientific sub-culture with our society, that quantifiable things tend to take precedence over non-quantifiable things, and hence undue weight tends to be given to the insignificant things that CBA is able to measure with precision, while the crucial unmeasurables get neglected." (Williams, 1973) This problem particularly presents itself in the process of measuring effectiveness when measurable proxies are used in the place of more meaningful factors. "However, if some of the important factors can be reduced to quantitative terms, it is often better to do so than not to do so. The resulting analysis narrows the area within which management judgement is required, even though it does not eliminate the need for judgement." (Anthony, Herzlinger, 1980)

d. Political Constraints

When analysis is applied in the area of governmental activities, there is the additional problem of the influence of politics. "Public policy is made in a

political environment. It affects, to a greater or less degree, what problems are analyzed, who does it, how it is done, what decisions are made as a consequence, and how those decisions are implemented. Policy analysis must thus cope with politics." (Quade, 1975)

e. Uncertainty

Again, we turn to comments made by Edward G. Quade in his text <u>Analysis for Public Decisions</u> regarding uncertainty. He states the major pitfall is to neglect uncertainty by assuming it away and presenting an over simplified problem as one of certainty. "It is also not enough just to acknowledge that uncertainties exist and to warn the user that some things have been left out of a study because of the lack of information. We must have high confidence that the omissions do not have critical a (sic) effect on the final outcome of the study. The user, if not the analyst, has to come to grips with these omitted factors or issues and he needs to know what their effects are likely to be, how likely they are, when he can expect them, and what he might be able to do about them." (Quade, 1975) Sensitivity analysis is often applied, along with regression analysis and other statistical techniques, to show the effects of changing assumptions or conditions on the acceptability of alternatives under uncertainty.

2. Conclusions

In our concluding remarks, we first wish to make the brief point that an analyst should not be prevented from making his or her own conclusions and recommendations in an analysis. "It is important for the analyst to distinguish carefully between what a study actually shows and the recommendations he or she may make on the basis of what he or she thinks the study implies. But, having clarified that point, the analyst should not be prevented from making recommendations or, at the very least, from drawing some conclusions." (Cornell, 1980)

The purpose of this chapter has been to discuss the procedures and techniques applied in cost effectiveness analysis and to identify some of its inherent problems. What is cost effectiveness analysis? It involves practical application of scientific methods. It is a mixture of, on the one hand, objectivity, traceability through proper documentation and a logical sequence of steps; on the other hand, it involves subjectivity, judgements and real world constraints. It is a social science and may often result in suboptimizing instead of the ideal of optimization.

The techniques and procedure outlined in the review of the literature will provide the foundation for the analysis that follows. Because problems and the techniques used to solve them differ greatly in their nature and scope, not all analysis can be conducted and documented in one

precise fashion. That is why the literature often provides general guidelines rather than a more precise methodology. Within the process, however, we will attempt to follow the logical step by step format and adhere to the guidelines that are given in this chapter where they apply. In this regard, we shall first identify the specific problem, the alternativesand criterion in the following chapter. Within that chapter, the relevence of the distinction made between criteria that involve economic efficiency issues and other, lower level criteria will become evident in the discussision concerning the scope of the problem and selection of the criterion. The measurement phase, which includes the process of identifying and measuring cost and effectiveness factors will then be documented in chapters four and five respectively. The evaluation phase will be displayed in the following chapters. The process will then culminate in the last chapter, which contains our findings and recommendations.

III. SPECIFICATION OF PROBLEM, ALTERNATIVES AND CRITERION

A. INTRODUCTION

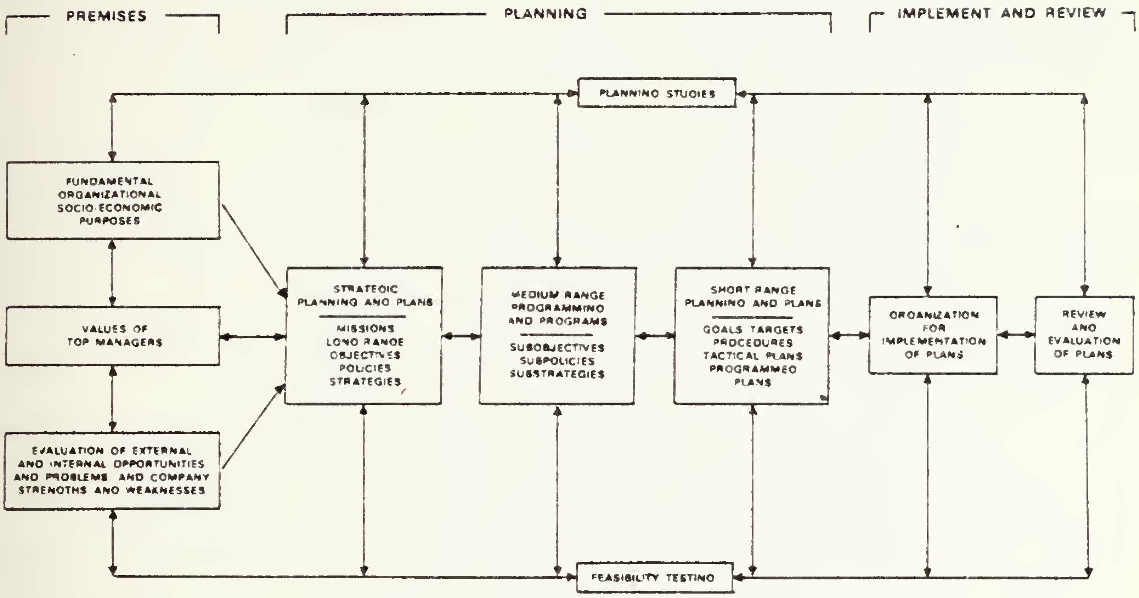
This chapter will provide a discussion of the actual problem situation as we perceive it, an identification of the alternatives and the criterion to be employed during the evaluation phase of our analysis. Given the general information contained in chapter one concerning the background and purpose of the Coast Guard's CVS program, and the basic cost effectiveness analysis methodology discussed in chapter two, we can now direct our attention to the more specific factors involved in this analysis.

1. Purpose

This and other types of analysis are classified as "planning studies" by author George A. Steiner in his conceptual model of planning which is reproduced in figure III-1. The figure indicates how planning studies interact with other planning activities. These studies provide various types of information to management and "are usually basic premises which are of high significance in guiding the planning process." (Steiner, 1969)

The concept of a planning study is similar to, but more general than, that of program evaluation referred to in chapter two. Although both are management tools used in the planning process, a program evaluation more specifically

FIGURE III-1
Structure and Process of Business Planning



Source: Top Management Planning by George A. Steiner, 1969

deals with measuring the accomplishments of an ongoing or completed program. In a letter of promulgation dated 5 November, 1968, the then Coast Guard Commandant, Admiral W. J. Smith indicated his view concerning the purpose of what he called special analytic studies. "Special Analytic Studies form an integral part of our Planning, Programming, and Budgeting System. These studies analyze feasible alternative policies and procedures for conducting old programs or for solving new problems. In this way they provide top management at Headquarters with a sound analytical base for decisions which allocate resources, control relative program emphasis, and direct the Coast Guard's course into the future." (Smith,1968) It is the purpose of this thesis to provide information and analysis which may be useful to CVS program planners and managers with regard to the inspection of U.S. flag vessels in foreign countries as an ongoing Coast Guard function.

2. Scope

In order to understand the relative scope of this particular analysis, it may be helpful to look at some recent studies that have dealt with the cost and/or effectiveness aspects of government or Coast Guard regulation. An analysis titled "A Study of Costs, Benefits, Effectiveness of the Merchant Marine Safety Program" which was conducted by the Coast Guard and published in 1968 focused on program

effectiveness. This analysis compared in-house program costs including both vessel inspection and personnel licensing functions versus estimates of lives saved as a result of these functions. Among other things, the study group concluded that the CVS program is highly effective in preventing a significant amount of deaths, injuries and property damage. In a study titled "How Effective is the Coast Guard in Carrying Out its Commercial Vessel Safety Responsibilities?" which was submitted to Congress by the General Accounting Office in 1979, an evaluation of CVS program efficiency and effectiveness was conducted with a number of recommendations made to correct current problems and effect general improvements in operations. The general problems are referred to in chapter one. The scope of this study is somewhat similar to the Coast Guard analysis in that the latter considered several functions within the CVS program including inspection, licensing, efforts to comply with international agreements, and in-house training and staffing. There was, however, little emphasis on the identification and measurement of program costs in this study. A study of similar scope but with an emphasis on costs titled "Commercial Vessel Safety Economic Costs" was published later in 1979 by the Planning Research Corporation Systems Services Company. This study was concerned with a broad economic assessment of the costs and cost impacts of Coast Guard regulations. Together with the follow-on reports

submitted in 1980 concerning an economic assessment of benefits, it is probably the broadest in scope regarding evaluation of costs and benefits of the studies herein being referred to. It is also similar to one by author John Cameron which was submitted by Ernst and Whinney to the U.S. Maritime Administration of the same year. The work titled "Cost Impact of U.S. Government Regulations on U.S. Flag Ocean Carriers" contains an evaluation of the cost impacts of federal regulations on the U.S. shipping industry rather than the economy as a whole. It does however consider other agency regulations in addition to those enforced by the Coast Guard.

An interagency study by the Department of Transportation, Coast Guard and the office of Management and Budget was completed in March, 1982, titled "Coast Guard Roles and Missions". It contains a comprehensive review of Coast Guard programs including commercial vessel safety with emphasis on functions that the study group concluded should be performed, reduced, eliminated or delegated to other agencies or private organizations. It is considered rather broad in scope in that it deals with overall strategies concerning the CoastGuard in the future.

Compared tothe other studies, our analysis is of relatively limited scope. We are dealing with a problem which pertains to a particular aspect concerning one of the

major functions within one Coast Guard program. The analysis focuses on vessel inspections in overseas locations. Our concern therefore is not total program cost effectiveness due to the limited nature of the problem. A study of this nature is more like an internal analysis concerned with a rather specific, mid-level problem that is conducted by staff personnel to provide information used in decision making.

B. PROBLEM SPECIFICATION

The essential problem addressed in this thesis will be formally introduced in this section. The Coast Guard performs CVS duties involving U.S. flag vessels wherever these vessels may be located on a continuing basis. Activities include new construction, conversion, periodic inspections, drydock examinations and shop tests of safety equipment. During the past decade, the Coast Guard opened several overseas inspection offices having permanently assigned personnel to carry out these activities in particular areas. The areas assigned to these offices included Europe, Africa, the Middle East and Far East. Other areas have been the responsibility of offices located in the United States except for activities in Puerto Rico and the Virgin Islands. During April of 1982, all of the major overseas offices were closed as a result of federal budget cuts carried out during that period. Offices or detachments in Rotterdam Netherlands, Yokohama and Kobe Japan, Singapore

and Guam were closed, and most of the personnel billets were discontinued in the effort to expeditiously cut costs. The activities previously carried out by those offices were assigned by geographic area to various offices located throughout the United States as noted in chapter one.

Conceptually, the closures have raised the possibility of several related problems, the most important and general one being a decrease in the level of effectiveness in the performance of CVS functions overseas. It should be made clear at this point that changes in effectiveness are perceived to be a potential problem only. Due to the closures and with the continuation of user fees, requiring reimbursement of travel and subsistence expenses, the Coast Guard has, on the other hand, enjoyed some savings in cost. The cost savings however, may or may not have compensated for changes in effectiveness. The level of effectiveness is related to several factors including:

1. Quality of vessel inspections performed overseas. Of the factors included, this is considered to be the most important because it is most directly related to the attainment of safety of life and property goals.

2. With an increase in the amount of travel, there is an increase in manhours attributable to unproductive travel time. This reduces the availability of personnel both at their permanent station and overseas. Personnel may be

especially unavailable for overseas emergencies on short notice.

3. Performance of duties by personnel on a temporary duty status has made the duration of visits more short-term in nature. As a result, there is a strong possibility for less consistency and cohesiveness in long-term jobs such as vessel construction because several persons may become involved. The importance of this factor has decreased as a result of delegation of new construction duties to the American Bureau of Shipping.

4. Planning and scheduling is required both of the local Coast Guard office managers and vessel owners and operators due to lead times involved. This itself takes time and effort.

5. On-the-job training of personnel is affected by the office closures because only qualified personnel should now be sent overseas where they work under rather autonomous conditions. The resulting effect, however, depends on the amount of training conducted at the overseas offices while in operation.

6. Morale is affected because personnel are sometimes separated by great distances from their families at short notice and for extended periods.

Of particular importance is the fact that an analysis was not conducted at the time of the overseas office closures for

the prediction of changes in cost and effectiveness. The problem therefore stems from the existence of uncertainty concerning the effects of the closures on CVS program cost and effectiveness. It is our objective to provide comparisons, of both cost and effectiveness under two significantly different methods of operation and to determine if effectiveness remains within reasonable limits.

C. THE ALTERNATIVES

Although there may conceivably be an infinite number of alternatives that could be considered, we have elected to compare what we consider to be the two basic alternatives that have fostered the uncertainty discussed in the preceding section. Other alternatives will be identified but will not be evaluated due to the specific nature of the problem and due to time, data and resource constraints. The two general alternatives that will be considered in this analysis are listed below. Other alternatives that may be considered feasible include factors such as the opening of a greater or lesser number of overseas offices than had been in operation, the placement of offices in different locations and the employment of a different number or rank structure of personnel that had been stationed overseas. Whether or not user fees should be charged is another issue affecting the range of alternatives. Solving complex problems having a large number of alternatives normally involves the use of

operations research techniques. One alternative that is considered infeasible involves the discontinuance of overseas functions altogether. The Coast Guard must enforce the laws that are passed by Congress and assigned as its responsibility. This is an assumed legal constraint.

1. Continue Present Operations

The basic process begins with a request from a vessel's owner or operator for an inspection overseas. A person stationed within the United States at the office responsible for the particular area is then assigned. Personnel are sent overseas to perform individual or a small number of inspections over periods of usually six weeks or less. They are issued temporary additional duty (TAD) orders and normally draw a portion of their travel and subsistence funds in advance with any additional funds reimbursed after the trip. Under this alternative, the overseas offices would remain closed. The present user fee system would remain in effect. This particular user fee system requires reimbursement of an inspector's allowable travel and subsistence expenses by a vessel's owner or operator. Its establishment in 1980 was based on the premise that those who most directly benefit from government services should pay for all or part of the costs incurred.

2. Reopen the Overseas Offices

This alternative involves the reopening of the same offices that were closed in 1982 and the continuance of the

present system of user fees applying also to alternative one. The type of facilities, their size, location and staffing levels would be equal to that which was employed just prior to the closures.

D. CRITERION

As discussed earlier in this chapter, the scope of this analysis is considered to be somewhat below the conceptual level normally calling for an economic efficiency criterion. The purpose of a criterion, as noted in chapter two, is to make an objective comparison between alternatives under specific decision rules. Because we anticipate unequal amounts of both cost and effectiveness to be measured under each alternative, the more common fixed cost/maximum effectiveness or fixed effectiveness/minimum cost criteria cannot be applied. The criterion used in this analysis involves minimization of the ratio of cost to effectiveness for each alternative. The level of effectiveness attributable to each alternative should itself be evaluated so it can be determined whether or not it lies within acceptable limits. Evaluation of the alternatives is documented in chapter seven. In the following two chapters, the cost and effectiveness of each alternative will be identified and measured.

IV. DESCRIPTION AND MEASUREMENT OF COSTS

A. INTRODUCTION

The purpose of this chapter is first to identify and classify the various costs that pertain to the Coast Guard Commercial Vessel Safety program operations overseas which are relevant to the alternatives. A description of the several categories of costs is contained in the following section. The costs will then be tabulated in section C of this chapter so that they may subsequently be used in the evaluation of the alternatives. We have elected to tabulate costs on a quarterly basis within the fiscal years for two reasons. Firstly, because the overseas offices were effectively closed in April of 1982, which is near the mid-point of the fiscal year, the cost and effectiveness results attributable to the period would be significantly affected by factors contained in both alternatives. A clear separation of the costs and effectiveness attributed to each alternative is necessary for a meaningful comparison or evaluation to be conducted. Secondly, a quarterly breakdown may prove helpful in the identification of recent trends which may otherwise not be apparent in an annual or semi-annual breakdown unless data is available that spans a number of years.

It is often the case that cost effectiveness analysis is applied to situations where the choice of a new project or program is contemplated. This means that alternative courses of action have not yet been put into operation, and the analysis is therefore future oriented. In these situations, costs are normally estimates of future costs which would be incurred if a particular alternative were instituted. Esitmates of future costs are, of course, often based on historical data. There is however a unique feature of the present problem. Our analysis compares two alternatives that have already been in operation in the recent past. The various overseas marine inspection offices were in operation until April, 1982. Since that time, all overseas Commercial Vessel Safety duties have been carried out by inspection personnel travelling TAD from offices located in the United States. We have therefore chosen to base the determination of costs of the alternatives on data derived from operations occurring in fiscal 1981, 1982 and the first two quarters of 1983, and to consistently use a past rather than future orientation. This orientation is sometimes used in situations, like this one, that evaluate on-going programs for the purpose of improving either program efficiency or effectiveness. There are two advantages in adopting this orientation within the context of our analysis: (1) actual and standard cost data is available that pertains to both alternatives, and (2) data pertaining to the effectiveness of

the alternatives has also been obtained within the same time frame.

It should also be pointed out that only those costs incurred by the Coast Guard and attributable to the CVS program are of primary concern here. There may be other costs indirectly incurred by other agencies which could be affected by the alternatives. An example is a change in State Department costs of an overseas embassy due to the administration of government personnel stationed there. The costs incurred by the various shipping companies that are our customers and which pay for the services they receive via user fees are very significant but will not be considered within the basic evaluation. Shipping companies that receive Coast Guard services in foreign countries under the Commercial Vessel Safety program have been required by law to reimburse the government for travel and subsistence expenses incurred by the Coast Guard. This requirement was first contained in 46 US Code 3826-1 which became effective October 3, 1980, and subsequently recodified under 46 USC 3317 (b) with passage of Public Law 98-89 in 1983. In closing, there are a number of assumptions made that are related to the identification and measurement of costs in this chapter. These assumptions are identified and explained in the following section.

B. CLASSIFICATION OF COSTS

There are five major catagories of costs which pertain to the alternatives. Each will be discussed separately within this section.

1. Overseas Offices Operating Costs (OOOC)

The first category of costs are those that were regularly incurred to operate the various Commercial Vessel Safety units located in foreign countries prior to their closure. Under the premise that this has been an on-going program, any startup costs that may have occurred in the past are not included. Nonrecurring costs that may have been incurred for the actual closure of the overseas offices are also not considered to be relevant. For this reason, only the actual quarterly operating costs reported prior to the formal closing date of the overseas offices will be used. Under this category of costs, actual operating expenses obtained from internal Coast Guard comptroller division reports will be utilized within the separate time compared. These costs are only pertinent to alternative 2.

2. Incremental Personnel Moving Costs (IPMC)

This category includes the incremental costs incurred to permanently transfer personnel to and from the United States over and above the cost for an equal number of transfers made completely within the United States. A form of average costs will be used in this category because we

believe a computation attempting to measure actual costs would be difficult and cumbersome. For any particular transfer, actual moving costs are affected by a person's rank, distance travelled, and number of dependents. It is therefore more practical to use standardized costs within this category.

Given the billet structure that existed for the overseas offices prior to their closure, the incremental moving costs will be computed based on the following assumptions: (1) that each tour of duty is three years in duration, (2) even though the overseas offices were closed so that savings could be realized through elimination of the personnel billets, we are assuming a constant force level. In this regard, it is assumed that the personnel and billets that existed in the far east were reassigned to the Marine Safety Office, Honolulu, and the personnel and billets at the Rotterdam office were reassigned to Marine Inspection Office, New York. Standard moving costs are computed under two basic categories, INCONUS and OUTCONUS (referring to moves that occur within the Continental U.S. or not). Under the Coast Guard's system of Standard Costing, savings in moving costs are only realized where CVS personnel that had been stationed overseas are relocated within the Continental United States. The incremental costs are the difference between the costs

computed for overseas and domestic transfers and only pertain to alternative 2.

3. Incremental Living Allowances (ILA)

The incremental living allowances are those paid by the Coast Guard to personnel stationed overseas over and above any such allowances that are paid to personnel stationed within the United States. Like moving costs, these allowances are affected by a number of factors including rank, number of dependents and location of duty. Due to the complexity of computing actual costs, a form of standardized costs will be used to compute the differential in living allowances paid to overseas personnel. The assumption listed above concerning relocation of overseas billets and the savings realized under the standard cost system will also be applied within this category. These costs would only be incurred under alternative 2.

4. Lost Time To Travel Cost (LTTC)

There is a significant amount of time spent travelling in almost every overseas CVS function performed except for those that occur in the local area of an overseas office. Even the personnel that were stationed overseas spent a considerable amount of time travelling to distant locations that were within the particular geographical jurisdiction of their office. If one considers the time spent travelling beyond a local area as unproductive, then there is a cost attributable to this lost time. It is considered

an opportunity cost because the time could have been spent in the actual performance of commercial vessel safety duties. We are not necessarily trying to say that this travel time should be minimized merely because it is labeled unproductive, but one must realize that there is a cost involved. Many organizations grapple with problems of this nature when attempting to allocate their resources in an optimal manner. A Marine Inspection Office in every port and near every shipyard would definitely cut down on lost time due to travel, but the operating costs of these offices would be enormous. On the other hand, sending personnel from the United States on a temporary duty status to conduct all commercial vessel safety functions overseas greatly increases the costs attributed to unproductive travel time while decreasing operating costs. A trade-off between these costs is an essential part of the decision making process.

Travel time costs are computed using two factors: actual manhours lost to travel and standard personnel costs. A travel claim is normally submitted in every case that requires personnel, stationed overseas or in the United States, to perform commercial vessel safety duties that involve travel outside a local area. The entire amount of time spent during temporary additional duty is accounted for in the standard travel claim under various catagories. The time that is coded TDY in a claim is considered the amount

of time actually available for the performance of duties and is labeled manhours available for work or MHAW within the data we have assembled. A portion of this time may be considered "unproductive" such as meal time and regular off hours but it does not pertain to lost time due to travel which concerns us here. For each claim submitted, the manhours lost to travel or MHLT is computed by subtracting the time available for work from the total time reported not including time on leave status. The lost time to travel can then be aggregated under a particular fiscal period by rank. This is converted to an equivalent amount of manyears and multiplied by the standard personnel cost for a particular rank. The lost time costs for the various ranks are then summed to determine the total cost under a particular time period. These costs are pertinent to both alternatives because both domestic and foreign personnel submit travel claims for overseas inspections although in different amounts. The standard personnel costs are listed in table IV-1.

The formula used to compute LTTC for a particular rank and within a particular quarter is:

$$LTTC_{rank\,qtr} = ((\sum_{qtr} MHLT_{rank})/1688)(SPC_{rank})$$

The total LTTC for a particular quarter is :

$$TLTTC_{qtr} = \sum_{rank} LTTC_{qtr}$$

where:

LTTC = lost time to travel cost.

MHLT = manhours lost to travel.

1688 = a factor used by the Coast Guard in projecting its CVS staffing requirements that is based on a 211 day work year of 8 hours per day (after accounting for leave, holidays, etc). This factor is used to convert manhours to manyears.

SPC = the standard personnel cost computed for each fiscal year by rank. These figures are listed annually in Commandant Notice 7100, Standard Personnel Costs.

Table IV-1

Standard Personnel Costs (SPC)

RANK	FY81 $	FY82 $	FY83 $
E-7	22,100	26,600	27,800
E-8	25,000	30,100	31,500
E-9	28,600	34,500	36,100
W-2	24,000	27,700	29,000
W-3	28,000	32,300	33,800
W-4	33,000	38,100	40,000
ENS.	17,400	20,100	21,100
LTJG.	24,000	27,700	29,000
LT.	29,300	33,900	35,600
LCDR.	35,000	40,600	42,500
CDR.	41,300	47,900	50,300
CAPT.	49,800	57,700	60,500
GS-11	22,800	23,900	24,600
GS-12	26,951	28,245	29,374
GS-13	32,200	33,800	34,900

Source: Commandant Notice 7100, Standard Personnel Costs, distributed annually.

5. Billing Lag Time Costs (BLTC)

The final category involves the cost of money to the Coast Guard that is imputed as a result of normal administrative delays in billing customers for our overseas CVS services and in the receipt of payments. Four assumptions are applied in the computation of these costs. The assumptions are: (1) that all personnel receive advance per-diem and travel funds just prior to their departure on temporary duty, (2) that the advances in funds are equal to the actual funds payable, (3) that the Coast Guard receives payment for their services 34 days after the date of a bill, (4) that the appropriate interest rate to apply in the computation is the same rate applied by the Coast Guard in a particular time period for overdue payments.

It is not very difficult to argue that persons going on TAD (temporary additional duty) receive advances of at least a major portion of the estimated funds authorized for a trip. This normally includes the purchase of an airline ticket. Whether the advances actually equal the amounts authorized is much less certain. The second assumption however is necessary to allow a workable estimation of the billing time costs. The 34 day time lag is assumed for two reasons. First, there is an incentive for customers to pay a bill exactly 30 days after receipt. The Coast Guard specifies on

the bill that the amount is due within 30 days of receipt and charges interest thereafter. There is, therefore, no incentive to pay earlier than within the 30 days allotted but there is a strong incentive not to go beyond this limit. The additional 4 days are attributed to the time it takes to deliver or mail a bill to a customer. Billing dates are known but the date a customer receives the bill is not known. Because the date of receipt is used to begin the 30 day payment period, a reasonable amount of time to deliver the bills must be assumed. The problem of choosing an appropriate interest rate in computing the cost of money was discussed earlier in Chapter II. We believe the rate applied by the Coast Guard in charging for overdue bills is appropriate. These rates are current in that they are published by the Treasury Department on a quarterly basis and they are the same rates that the Coast Guard would realize in the collection of past due amounts. The applicable interest rates are listed in table IV-2.

TABLE IV-2

Quarterly Interest Rates

Qtr	Rate	Qtr	Rate
1-81	13.14	2-82	14.39
2-81	13.14	3-82	13.22
3-81	17.64	4-82	14.26
4-81	16.20	1-83	12.00
1-82	18.35	2-83	13.00

Applying the assumptions is just mentioned, billing time costs can be computed as follows: The funds pertaining to any particular bill are considered to be "out of pocket" from the date an overseas trip is begun until a customer's payment is received. The amount of time used in the computation regarding each amount billed is then the number of days between the date of departure and the bill date plus 34 days. The total time lag aggregated in a particular fiscal period is converted to an equivalent amount of years and multiplied by the interest rate matched with that period to obtain a billing time cost. Due to the fact that bills are issued for overseas services provided by either domestic or foreign based personnel, billing time costs can be attributed to both alternatives before the overseas offices were closed and toalternative 1 subsequent to the closures.

The formula used to compute BLTC for a particular quarter is:

$$BLTC = [\sum_{qtr} ((BDBD+34) / 365)(AMTB_{qtr})](IRATE_{qtr})$$

where:

BLTC = billing lag time cost

BDBD= the number of days between aninspector's departure date and the date of the bill concerning a particular trip.

365 = a factor used to convert the number of days to an equivalent amount of years.

IRATE =the interest rate used within a particular fiscal quarter.

AMTB = the dollar amount billed for reimbursement of a particular overseas inspection within a particular fiscal quarter.

A major item of cost, that of basic personnel salaries and allowances, is considered to be irrelevant because those persons performing commercial vessel safety duties overseas would continue to be paid this amount whether they are stationed in the United States or overseas. This implicitly assumes the number of personnel within the program is equal for each alternative. Any field level personnel reductions that may have occurred at about the same time the overseas offices were closed can be attributed to projected decreases in workload due to the delegation of inspection duties to the American Bureau of Shipping. Program administrative costs are also assumed to be irrelevant because, although program administration may entail differing functions under each alternative, total costs are considered to be approximately equal. In support of this assumption, we found no evidence of administrative personnel reductions or increases at the headquarters or district level that directly resulted from the closure of the overseas offices in 1982. The computations of relevant costs that have been identified in this section will be displayed in the following section.

C. DETERMINATION OF COSTS OF THE ALTERNATIVES

In this section, the costs attributable to each of the alternatives will be tabulated under the five categories of costs identified in the preceeding section. The quarterly

(fiscal) totals will then be summarized in 1982 dollars to facilitate comparisons of the alternatives in chapter seven.

1. Overseas Office Operating Costs, By Quarter (OOOC)

Table IV-3

Overseas Office Operating Costs, by Quarter (OOOC)

	1-81	2-81	3-81	4-81	1-82	2-82
Rotterdam:	19845	29197	13888	11569	8454(1)	12439
Kobe:	20463	17943	19764	12981	21187(1)	18578
Singapore:						
actual	--	106	120555	20133	27323(2)	27323
yr.aver.(3)	35198	35199	35198	35199	27323	27323
Guam:						
total	15465	11984	10637	6585	9248(1)	7167
CVS port.(4)	6240	4836	4292	2657	3732	2892
TOTAL: (rows 1,2 4,6)	81746	87175	73142	62406	60696	61232

(Source: Coast Guard Reports "Operating Costs of Coast Guard Marine Safety Offices")

NOTES TO TABLE IV-3:

(1) Because the individual first quarter FY82 figures are not available, the amounts were extracted from the second quarter cumulative figures at the same ratio that exists between the two quarters in FY81 for each office except Singapore.

(2) Because the first quarter FY82 figure was not available, and due to the irregular FY81 cost pattern, the amounts

listed are one half of the second quarter FY82 cumulative total.

(3) Due to the irregular pattern of expenses reported for the Singapore office, the actual amounts for FY81 are averaged.

(4) Because the Marine Safety Office in Guam had other than CVS duties assigned to it, only a portion of the total costs are allocated to the CVS program. The 40.35% allocation rate is found in the Coast Guard's "distribution of resources" table tabulated by the budget division for 1981 for allocating costs of an average Marine Safety Office to the CVS program.

(5) These costs apply only to alternative 2.

2. Incremental Personnel Moving Costs, by Quarter (IPMC)

Given the actual billets assigned to the overseas offices as of 31 January 1982 that are listed below in table IV-5, and applying the assumption that only personnel billets assigned to Rotterdam would be relocated in the Continental U.S. as discussed in the previous section, an estimation of the incremental personnel moving costs can be made. The average quarterly cost is shown below in table IV-4 computed in 1982 dollars. The average incremental cost per billet listed in column three is the difference between the average OUTCONUS recurring cost per billet and the average INCONUS recurring cost by billet type which were taken from the 1982 Coast Guard Standard Personnel Cost data. Only 1982 average

figures are used because later cost comparisons will be made in 1982 dollars, and because the 1981 figures were not based on actual cost data but were merely earlier figures projected forward with inflation factors applied.

Table IV-4

Average Quarterly Incremental Moving Cost

Billet type	Number of billets	Avg. Incremental cost per billet	Annual cost	Quarterly cost
Officers	8	5562.00	44,496.00	11,124.00
Civilians	2	560.00	1,120.00	280.00
		IPMC total per quarter		11,404.00

NOTE: The cost only applies to alternative 2.

Table IV-5

Overseas CVS Billets

	Number	Rank
Rotterdam:	1	Commander
	2	Lieutenant Commander
	3	Lieutenant
	2	Warrant Officer (W4)
	2	Civilian (GS-1)
Singapore:	1	Commander
	1	Lieutenant Commander
	1	Lieutenant
	1	Warrant Officer (W4)
Kobe:	1	Captain
	1	Lieutenant Commander
	1	Lieutenant
	1	Lieutenant (jg)
	2	Warrant Officer (W4)
	1	Yeoman Chief (YNC)
	1	Petty Officer (SKI)
Yokohama:	1	Lieutenant Commander
Guam:	1	Lieutenant Commander
	1	Lieutenant (jg)
	1	Yeoman Chief (YNC)

3. Incremental Living Allowances by Quarter (ILA)

The incremental amount of living allowances is that amount paid to overseas personnel which exceeds the amount paid to personnel stationed within the Continental U.S. Two types of allowances are paid to military personnel stationed outside the Continental U.S. These are a cost of living allowance (COLA) and a housing allowance (HOLA). Our estimate of these costs is tabulated below in table IV-6 using 1982 annual average figures for officers taken from the consolidated monthly reports of COLA and HOLA allowances overseas, form CG-3376. The average per person figures for 1982 are based on actual 1982 cost data compiled by the planning and evaluation staff under the Office of Personnel at Coast Guard headquarters. The assumption that only Rotterdam billets are relocated within the Continental U.S. under alternative one is again being applied as it was in estimating incremental moving allowances.

Table IV-6
Average Quarterly Incremental Living Allowance

Billet type	Officers
Average COLA per person per month	191.00
Average HOLA per person per month	413.00
Total per month per person	604.00
Total per Quarter per person	1812.00
Number of officers	8
Total ILA per quarter	14,496.00

NOTE: This cost applies only to alternative 2.

Table IV-7
Lost Time Due to Travel Cost by Quarter

	ALTERNATIVE 2 ←					→ ALTERNATIVE 1				
RANK	FISCAL QUARTER									
	181	281	381	481	182	282	382	482	183	283
E-7	-	-	-	-	-	-	670	698	571	3,297
E-8	-	-	-	-	-	-	-	-	-	-
E-9	-	-	-	-	-	-	-	-	-	-
W-2	145	2,342	5,781	2,741	4,395	1,936	3,542	22,023	7,961	11,095
W-3	893	383	620	6,306	2,051	2,448	6,025	880	4,605	1,352
W-4	1,056	1,185	3,182	607	2,601	1,258	576	4,010	16,357	3,406
0-1	-	-	-	-	-	-	-	738	2,228	725
0-2	562	3,850	526	6,286	3,724	1,410	4,769	17,644	14,158	13,289
0-3	12,144	17,436	22,097	12,600	25,482	31,469	16,764	35,150	49,513	49,735
0-4	2,703	5,796	17,490	17,332	12,814	24,645	10,594	13,707	7,009	11,823
0-5	2,525	954	7,897	28,772	4,032	6,945	894	-	-	3,476
0-6	1,077	643	-	1,906	4,273	3,846	-	2,801	-	-
GS-11	-	1,459	-	-	-	-	-	-	-	-
GS-12	319	-	1,381	-	-	841	-	1,027	-	976
GS-13	-	-	-	-	-	-	-	-	1,473	-
TOTAL	21,424	34,048	58,974	76,550	59,872	74,798	43,834	98,678	103,875	99,174

4. Lost Time Due to Travel Cost (LTTC) by Quarter

The actual costs attributed to travel time under overseas inspections were computed using the formula identified in section B of this chapter and are tabulated below in table IV-7. These quarterly costs were computed by personnel rank and are in current dollars.

5. Billing Lag Time Costs (BLTC) by Quarters

The imputed costs attributed to administrative billing lag time were computed using the formula identified in section B of this chapter. These costs are tabulated below in table IV-8 for each of the two alternatives on a quarterly basis.

Table IV-8

Billing Lag Time Costs by Quarter

Fiscal Quarter	ALT 1	ALT 2
1-81	—	3901
2-81	—	6821
3-81	—	15060
4-81	—	12560
1-82	—	7037
2-82	—	7258
3-82	5857	—
4-82	11083	—
1-83	8726	—
2-83	8251	—

NOTES: (1) Figures are uncorrected for inflation.
(2) Figures are rounded to nearest dollar.

6. <u>Total Operating Costs Under Each Alternative, by Quarter</u>

The following table contains the totals of the five costs attributable to each alternative per quarter. For alternative 1, total costs consist of the sum of LTTC and BLTC. For alternative 2, total costs consist of the sum of all five categories of cost, OOOC, IPMC, ILA, LTTC, and BLTC. These totals have been converted to second fiscal quarter dollars using the implicit price deflators for gross national product that are computed by the Federal Reserve Bank of St.Louis and published monthly in the magazine "National Economic Trends." These deflators are compounded annual rates of change computed on a quarterly basis.

Table IV-9

Total Operating Costs For Each Alternative by Quarter

Fiscal Quarter	ALT 1	ALT 2
1-81	—	143,343
2-81	—	164,874
3-81	—	186,057
4-81	—	189,125
1-82	—	160,106
2-82	—	169,188
3-82	46,908	—
4-82	104,712	—
1-83	107,647	—
2-83	102,483	—

V. DESCRIPTION AND MEASUREMENT OF EFFECTIVENESS

A. THE EFFECTIVENESS MODEL

In this chapter, we will attempt to provide a measure of the effectiveness of each alternative that is both objective and meaningful. Some of the common problems associated with measuring effectiveness were discussed in chapter two. In that chapter, we referred to Anthony's definition of effectiveness which is the extent to which actual output corresponds to the organization's goals and objectives. It is especially difficult to measure effectiveness in a service oriented or non-profit organization such as the Coast Guard.

Regarding output, the Coast Guard routinely meets the objective of carrying out one hundred percent of its CVS duties in the area of U.S. flag vessel inspections that are required by law. This output level does not include inspections of the courtesy or "spot check" type or the effects of routine time lags in scheduling a particular inspection. Given that actual output quantity is at or near one hundred percent of the expected amount, we should therefore be concerned with the quality of that output. It is the objective of the effectiveness model to measure inspection quality. In this process, Niskanen's recommended charactistics of an effectiveness measure should be

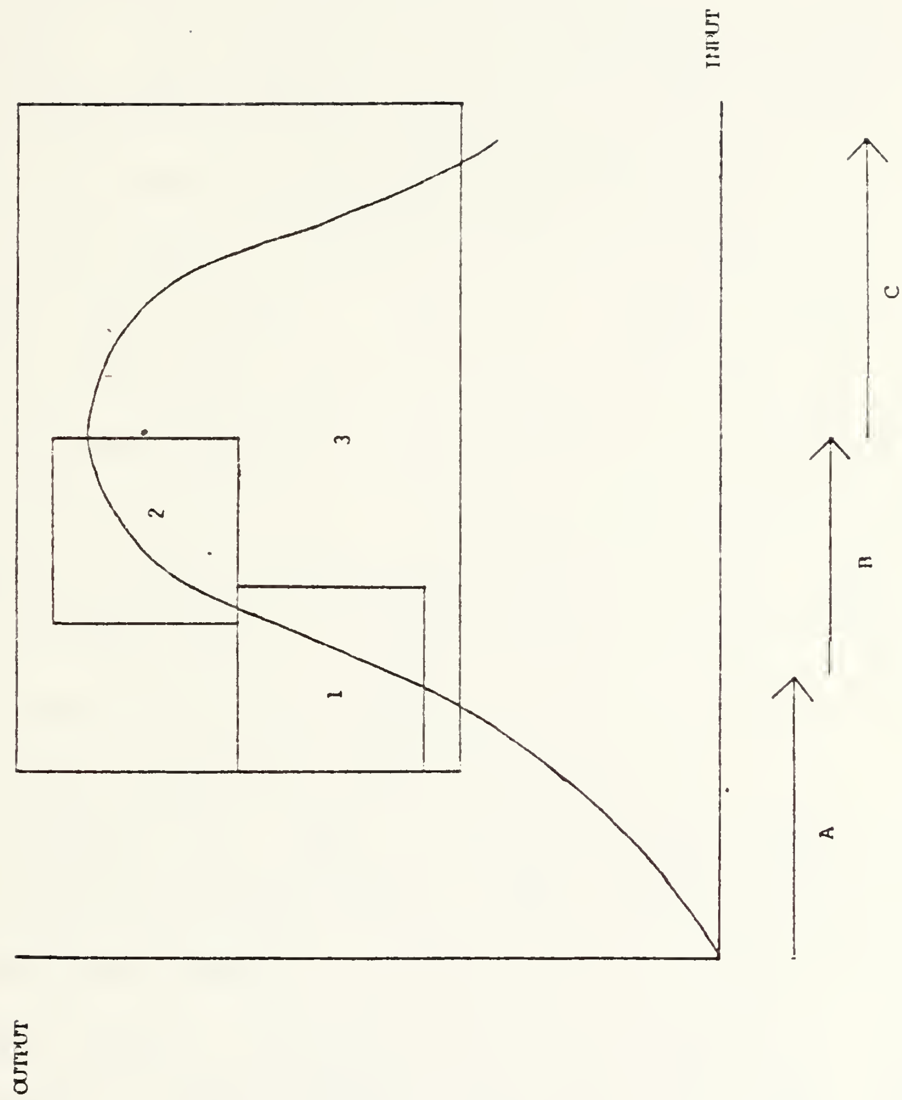


Figure V-1

remembered. He recommends that an effectiveness measure be both relevant and quantifiable. Objectivity is also desired in any measure that is employed.

Our method of measuring effectiveness involves the use of a mathematical model that is predicated on the economic law of diminishing returns. Any output requires the employment of some input. An example of the general relationship between input and output, which is often called the production function, is depicted in figure V-1. In this graph are three distinct conceptual relationships that exist between input and output. The first range, labelled A, corresponds to the theory of increasing returns to a variable input. The range labelled B, corresponds to a diminishing but positive return to a variable input and range C corresponds to a diminishing and negative return. When more than one input is involved, each usually has its own unique functional relationship within a relevant range. Not all curve forms will therefore look exactly alike.

We have chosen four input oriented factors that will be used in the effectiveness model. These factors are included for the following reasons: (1) We consider these factors to have a direct impact on the outcome being measured. (2) The necessary data is quantifiable, reasonably available and is objective in nature. The four factors are: (1) inspection manhours, (2) personnel rank, (3) the number of personnel involved in an inspection and (4) the number of formal

requirements issued at an inspection for outstanding deficiencies. These are called CG-835's. The effectiveness model (formula 1) is given below to indicate how these factors are applied. Three variations of this model are included (for a total of four formulas) so that the sensitivity of the relationship between alternatives can be evaluated. In formulas 2 and 4, the assigned weights for each factor are substituted with equal weights. In formulas 3 and 4, standard inspection manhours are used in the place of average manhours.

Effectiveness score =

100 [W [LN (ACTUAL MHRS./ AVERAGE MHRS.)]

+ X (ACTUAL RANK-AVG.RANK)

+Y (PERSONNEL SCORE)

+Z (LOG10 (ACTUAL # 835's ISSUED/ AVG. # 835's ISSUED))]

+100

Where W+X+Y+Z=1

Factors may have different individual relationships and thus be applied in different manners within a model because it would indeed be very difficult to conceive of such a precise orchestration of inputs that would result in uniform outcomes from a variance in each one. For example, if one desires to have a house painted, the effects of one painter versus two, of fifteen gallons of paint versus thirty, or of

twenty manhours of work versus forty, cannot all be the same on the desired outcome. Our estimation of the unique causal relationship portrayed by each of the factors was made with an application of the production function theory. Each factor's specific relationship with inspection quality was conceptualized and matched with a particular portion of the input/output curve within a predetermined relevant range. It is for this reason that the graph in figure V-1 is highlighted in the three areas labelled 1, 2 and 3.

Before discussing each factor, it should be pointed out that the overall design of the model is such that any inspection which equals the standard or average prerequisites will result in a score of one hundred. An above standard or average inspection results in a score above one hundred expressed as a percentage. A below standard or average inspection results in a percentage score below one hundred. It should also be remembered that the model is designed to measure quality only and not the efficiency within which the output is obtained from the inputs. Each factor is discussed in the order of their assumed importance.

1. Inspection Manhours

Actual inspection manhours for an individual inspection are compared to average manhours or the Coast Guard's standard manhours as a measure of inspection quality. This comparison involves the following assumptions. First, it is assumed that inspection quality varies with actual

manhours above or below the average or standard determined for that particular inspection. Average manhours are the arithmetic means derived from our sample of vessel inspection data. The data is listed in Appendix B. Coast Guard standard manhours were initially developed in 1972 from a collection of field unit data. The standards were updated during 1979-1980 through a Delphi survey taken among fifty field units due to vessel population and legislative changes. The standards were again modified in 1982 and are listed in the CVS operating program plan for fiscal years 1985-1994. Standard manhours have been determined by vessel type, (freighter, tanker, etc.) under several ranges of gross tonnage. The pertinent averages and standards are listed in table V-1. Second, it is assumed that the specific relationship between the ratio of actual to average or standard manhours and inspection quality resembles the natural log function. Under this assumption, manhours above average or standard result in higher quality that is subject to diminishing but positive returns. This functional relationship matches the portion of the curve in figure V-1 shown in box number two. When actual manhours equal the average or standard, the inspection is classified as standard by definition and a score of zero is obtained for this factor.

Table V-1

Average and Standard Inspection Manhours *

VESSEL TYPE AND SIZE	BIENNIAL		BIENNIAL & DRYDOCK	
	AVG	STD	AVG	STD
Cargo vessels less than 300 gross tons	18.17	10	31.83	16
Cargo vessels 300-19,999 gross tons	57.07	32	71.83	56
Cargo vessels of 20,000 gross tons and over	65.17	40	81.67	64
Tankships 1,000-19,999 gross tons	20.79	34	71.19	62
Tankships 20,000-39,999 gross tons	57.75	35	67.00	65
Tankships 40,000-74,999 gross tons	N/A	40	156.50	74
Tankships 75,000-124,999 gross tons	40.50	44	205.00	86
Mobile offshore drilling units	30.25	32	79.11	60
Liquified natural gas vessels	25.00	42	134.80	82

* Source of standard manhours: CVS Operating Program Plan, FY85-94

2. Personnel Rank

In the application of this factor, the average rank resulting from our data is used as a "standard" in comparison with actual rank. An average is used because a predetermined standard has not been documented for this purpose. Rank is used here as a crude measure of a person's experience and qualifications. Concerning inspection quality, it is assumed that the higher the rank, the better the quality within a relevant range. The particular relevant range is assumed to be rather narrow because most inspectors fall within the ranks of warrant and junior officers and are exposed to an equivalent amount of basic training upon entering the program. The relatively few exceptions include chief petty officers and senior officers below flag rank. With this in mind, actual ranks have been quantified in numeric codes listed in table V-2. The codes were designed with a ten percent spread above and below the rank of W-4 warrant and O-3 lieutenant. This implies that a captain performs an inspection that is ten percent better than a lieutenant who, in turn, performs an inspection ten percent better than a chief. When more than one person is involved in an inspection, their average rank is used. The above assumption underlies our conceptualization of the relationship between rank and inspection quality. A change in rank above or below standard is believed to have a linear effect on quality.

This corresponds to the approximately linear portion of the curve in figure V-1 shown in box number one where constant returns to a variable input are realized.

Table V-2

Rank Codes

RANK	CODE	RANK	CODE
E-7 E-8 E-9	2.7	W-4 O-3	3.0
W-2 O-1	2.8	O-4	3.1
W-3 O-2	2.9	O-5 O-6	3.2 3.3

3. Number of Personnel

Even though, in our data, the number of personnel involved in an inspection ranges from one to six, we assume the resulting range of effect of this input on quality to be relatively wide. In a very narrow range, usually one to three persons, inspection quality increases due to the additive effect of personal experience and expertise. Beyond a certain point, however, inspection quality would decline, even though there may be added benefits in the area of training unqualified persons. It is difficult to determine a point where diminishing and negative returns takes place due to an increase in the number of attending personnel.

Depending on the type of vessel, we have assigned various percentage scores which have been designed to quantify the relative effect a number of personnel are assumed to have on inspection quality. In this process, a score of zero signifies the "standard" and is used as a base in the determination of the other scores. We believe the inherent relationship between the number of persons and inspection quality includes both positive and negative incremental returns and therefore resembles the functional form of the curve in figure V-1 shown in box number three. The assigned personnel scores used in the model are listed in table V-3 by vessel type. Supply vessels are the equivalent of a freight vessel that is under 300 gross tons.

Table V-3

Personnel Scores

NUMBER OF PERSONS	VESSEL TYPE		
	FREIGHTER/TANKER	MODU*	SUPPLY
1	-.20	-.05	.00
2	.00	.10	.15
3	.20	.15	.10
4	.25	.05	.00
5	.10	-.10	-.15
6	-.05	-.30	-.40

* MODU stands for mobile offshore drilling unit.

4. Number of CG-835's Issued

In applying this factor, the actual number of CG-835's issued during a vessel inspection is compared to the average number obtained from the data. As with rank, an average is used because a predetermined standard is not available. Within the relevant range, we are assuming the relationship between CG-835's issued and inspection quality is similar to that of manhours in that the functional form resembles the log curve; referring again to box number two in figure V-1. The log base ten function is used instead of the natural log because we consider the effective range of this factor to be significantly smaller than that of manhours. The number of CG-835's issued above the average is considered an improvement in inspection quality, subject to diminishing positive returns. There are several underlying factors that influence the number of outstanding requirements issued. These include age of the vessel, location of vessel during an inspection (i.e. whether it is in a shipyard or near a source of repair or replacement items or not) and the style of a particular inspector. Considering the possible variability in these and other factors, we assume this factor's resulting effect to be less direct on inspection quality. We have therefore assigned it a relatively small weighting factor in the model.

5. Weighting Factors

The symbols w, x, y, and z are used in the model as multipliers of each of the four main factors so that they may be properly weighted. The magnitude of these multipliers corresponds to the relative importance we place on each of the factors within the model. In formula one, our basic model, and formula three, the weighting factors are: w = .40, x = .30, y = .25, and z = .05. In formulas number two and four, the weighting factors are equalized at .25.

B. DETERMINATION OF THE EFFECTIVENESS OF THE ALTERNATIVES

The effectiveness scores attributed to each of the ten fiscal quarters under consideration are listed in table V-4. These numerical scores were obtained by applying the mathematical effectiveness model and the three variations of the model to our inspection data sample. The data and the statistical package for the social sciences (SPSS) program used to process it are contained in appendix B. The best, worst and average scores for each of the two alternatives are also listed in the table under the respective time periods.

Table V-4

Effectiveness Scores

QTR	FORMULA: 1	2	3	4
Alt.2 (opened)				
1-81	92.7	99.03	109.77	109.70
2-81	93.66	96.22	99.59	99.92
3-81	69.71	78.24	91.45	91.82
4-81	83.97	90.81	97.72	99.40
1-82	67.40	75.64	89.14	89.22
2-82	98.65	100.86	113.09	109.88
Best	98.65	100.86	113.09	109.88
Worst	67.40	75.64	89.14	89.22
Average	84.35	90.13	100.13	99.99
Alt. 1 (closed)				
3-82	110.52	99.28	123.90	107.64
4-82	112.67	93.39	99.47	100.98
1-83	102.38	99.54	111.93	105.50
2-83	93.45	94.66	107.03	103.15
Best	112.67	99.54	123.90	107.64
Worst	93.45	93.39	99.47	100.98
Average	104.75	96.72	110.58	104.32

VI. PROGRAM ASSESSMENT

Several factors in the area of overseas CVS activities will be discussed in this chapter. Even though they are indirectly related to the cost effectiveness analysis, the assessment may provide useful information and insights.

A. APPLICATION OF SPSS

Several programs were developed using the Statistical Package for the Social Science (SPSS) to analyze the data. SPSS is an integrated system of computer programs designed for the analysis of social science data. It allows a great deal of flexibility in the format of data. SPSS offers a comprehensive set of procedures for data transformation and file manipulation as well as a large number of statistical routines commonly used in the social science.

Frequencies, condescriptive, scattergram, breakdown and regression procedures were used to analyze the data.

B. SOURCES AND DESCRIPTION OF DATA

The data for this study was collected in the two main categories of cost and effectiveness. The cost data was obtained from Coast Guard Headquarters (G-FAC) and the 14th C.G. District accounting division. These offices are responsible for processing the bills for recovery of travel and subsistence costs for the overseas CVS program. The cost

data is contained in two documents, Billing for Sale of Material or Services (CG-3621) and Travel Voucher or subvoucher (DD1351-2). The cost data is considered complete in that of the 925 bills issued during the time period studied, only one bill was not obtained. A copy of the documents and the raw data are contained in Appendix A.

The effectiveness data was collected from Coast Guard Marine Inspection Office, New York and Marine Safety Office, Honolulu. The data used in our effectiveness model were taken from completed CG-840 series inspection booklets. The vessels included in the population sampled were U.S. Flag, manned, oceangoing freightships over 100 gross tons, tankships over 1000 gross tons and Mobile Offshore Drilling Units (MODU). Vessels not included in the sample were Foreign Flag Vessels, uninspected vessels, vessels under major conversion, small passenger vessels, seagoing barges, inland or limited route vessels of any type, unmanned vessels of any type, integrated tug/barge configurations, tankships under 1000 gross tons, and freight/supply vessels under 100 gross tons, seagoing tugs, pilot boats, public vessels, ferrys, dredge barges and yachts.

The types of inspections included in the population sampled were Inspections for Certification (COI), done independently or in conjunction with a drydock exam (COI/DD). The types of inspections not included in the sample were major conversions, drydocks, repair, special inspections,

midperiods, partially completed inspections for certification and new construction inspections.

The above selection criteria were used in order to obtain a more homogeneous sample which would not be influenced by greater variability resulting from uncommon and special inspections.

The data was catergorized by the variable names listed in table VI-1 and coded in accordance with table VI-2. The inspection data was assembled in 263 data lines.

During the entire 81 and 82 fiscal years and the first two quarters of 83, Coast Guard headquarters (GFCA) and 14th District (fca) accounting divisions issued 700 and 225 billing documents respecctively. Several billing documents included billing for inspections performed in more than one time period or for several independent inspections. These were separated into a total of 1229 data lines. Inspections which covered more than one intervening month were apportioned equally during those intervening months. There were 662 travel claim data lines. The apportionment of billings and travel claims were implemented to give a more accurate account of travel and billings by time period. The cost data derived from overseas inspection billing documents and travel claims was assembled in a separate computer file. The data within this file was checked for correctness manually and with the aid of a fortran program written for

this purpose. The program is essentially a series of if statements which were designed to verify the proper format and range of variables and the consistency of variables being dependent on the values of other variables. The program was designed to check each data line independently and print a line of data if an error was detected in any one field. In running the program, twenty-one errors were detected and subsequently corrected. The program, titled Valprog Watfiv, is listed in Appendix D. The sample of inspection data used with our model to make measurements of effectiveness was validated manually. It was more practical to check the data in this manner because of its much smaller size in relation to the cost data. This data, and the SPSS program used to process it, are listed in Appendix B.

C. EVALUATION OF DATA

The data provides information about the amount and distribution of resources expended in carrying out the overseas inspection program. One important factor is the amount of manhours committed to the program in the 2-1/2 year period. The amount of actual manhours committed to the CVS program overseas is a measure of effort put forth by the Coast Guard. However the concept of evaluating the effort, or use of input and resources may or may not clearly indicate that the objectives of the programs are being met.

During the period under consideration approximately 239,670 manhours or 142 manyears were expended to the overseas inspection program. Of this total, 134.3 manyears or 94.6% was conducted by inspectors on temporary additional duty. Fiscal year manhour totals are provided in table VI-3. Because the Coast Guard lost 20 manyears due to travel, only 114.3 of the TAD manyears were actually available to conduct overseas inspections. Domestic offices had a mean loss rate of 15.3% while the overseas activities lost time to travel rate was 11.8%. The average length of an overseas trip increased 63% from 11.8 days in 1981 to 19.2 days in 1983. The length of the overseas trip in 1983 ranged from 14.6 hours to 76 days. Honolulu, a major participant which accounted for 30.8% of the allocated manhours in the first two quarters of 1983, had an average trip length of 35.1 days. The overseas offices prior to their closure accounted for 33.1% of the manhours devoted to the program. Table VI-4 lists the overseas offices contribution to the program. Based on manhours allocated in the first two quarters of each fiscal year there was a 27% increase in overseas inspection demand between 1981 and 1982 and a 15% increase between 1982 and 1983. There was a 23.8% increase between 1981 and 1982 based on the yearly allocated totals.

Table VI-1

Variables

Cost Variables:

Dist	_____	Coast Guard District or HQ unit
Yr	_____	Fiscal year of Inspection
Qtr	_____	Quarter and Fiscal Year of Inspection
Month	_____	Month and Calendar Year of Inspection
Rank	_____	Rank of Inspector
AMTB	_____	Amount billed to a particular company for a particular job
BDBD	_____	Difference between billing date and beginning date of inspection
BDCD	_____	Difference between billing date and completion date of inspection
MHAW	_____	Manhours available for work per overseas trip
MHLT	_____	Manhours lost to travel per overseas trip
MHTOT	_____	Total manhours per overseas trip

Effectiveness Variables:

TIMPD	_____	Catergory of data collection period
DATSO	_____	Office data was collected from (Source)
ITYPE	_____	Type of Inspection based upon office and inspection location
YRBLT	_____	Year vessel was built
GRTON	_____	Gross Tonnage of Vessel (Rounded)
VTYPE	_____	Type of vessel
ACTMH	_____	Actual manhours to perform inspection
STDMH	_____	Standard manhours projected to perform inspection
NU835	_____	Number of 835s issued
MONTH	_____	Month and Calendar Year inspection completed
YEAR	_____	Fiscal year inspection completed
NUISP	_____	Number of inspectors per inspection
STDCL	_____	Standard Class vessel inspection
INSCR	_____	Number of inspectors score

Table VI-2

Variable Codes

Month Codes:

Oct-10	Jan-01	Apr-04	Jul-07
Nov-11	Feb-02	May-05	Aug-08
Dec-12	Mar-03	Jun-06	Sep-09

Qtr. Code:

Oct-Nov-Dec	--1
Jan-Feb-Mar	--2
Apr-May-Jun	--3
Jul-Aug-Sep	--4

District/Office Codes

1st District-(Boston)	- 01	14th District-(Honolulu)	- 14
2nd District-(St.Louis)	-02	17th District-(Juneau)	- 17
3rd District-(New York)	-03	Headquarters	- 30
5th District-(Norfolk)	-05	Rotterdam	- 31
7th District-(Miami)	-07	Singapore	- 32
8th District-(New Orleans)	-08	Kobe	- 33
9th District-(Cleveland)	-09	Guam	- 34
11th District-(LA/Long Beach)	-11	Yokohama	- 35
12th District-(San Francisco)	-12	Rio Koje	- 36
13th District-(Seattle)	-13	Rio Chiba	- 37

Rank Codes:

Ens - 01	E-7 - 17	GS-11 - 11
LTjg - 02	E-8 - 18	GS-12 - 12
Lt - 03	E-9 - 19	GS-13 - 13
LCDR - 04	CWO2 - 22	
CDR - 05	CWO3 - 23	
CAPT - 06	CWO4 - 24	

TIMPD Codes:

Aug 79-Nov 80	1
Dec 80-Mar 82	2
Apr 82-Jul 83	3

Datso Codes:

New York	3
Honolulu	4

Table VI-2 (cont)

ITYPE Codes:

Foreign Inspection/Foreign Personnel	- 1
Domestic Inspection/Domestic Personnel	- 2
Foreign Inspection/Domestic Personnel	- 3

VTYPE Codes:

Supply Vessel	- 1
Freight ship	- 2
Tankship	- 3
Modu	- 4
Liquified natural gas carrier (LNG)	- 5

Standard Class Code:

Vessel Type/Size	Inspection for Certification	Inspection for Certification (w) Drydock
Supply/freightship <300 gt	10	11
Freightship > 300-19,999 gt	20	21
Freightship > 20,000 gt	22	23
Tankship > 1000-19,999 gt	32	33
Tankship > 20,000-39,999 gt	34	35
Tankship > 40,000-74,999 gt	36	37
Tankship > 75,000-124,999 gt	38	39
MODU	40	41
LNG Vessels	50	51

Table VI-3

Allocation to Overseas Program

FY	TAD (MH)	TAD(2) (MY)	Projected(3) local (MH)	Projected local (MY)	Total (MH)	Total (MY)
81	70723.5	41.9	9582.4	5.7	80305.9	47.6
82	87520.5	51.8	3335.5	2.0	90856.0	53.8
83	68508.5	40.6	---	---	68508.5	40.6

(1) 83 comprised only of 1st and 2nd quarters
(2) Manhours / 1688 = manyears
(3) Standard amount of time spent while not on TAD

Table VI-4

Overseas Office Contributions

FY	TAD (MH)	TAD (MY)	Local(2) (MH)	Local (MY)	Total (MH)	Total (MY)	% Total	% of Total TAD
81	25865.7	15.3	9582.4	5.7	35448.1	21	44.1	36.5
82	17933.3	10.6	3335.5	2.0	21268.8	12.6	23.4	20.5
83	------	----	------	---	-------	----	----	----

(1) Overseas Activities closed in April 1982
(2) Standard amount of time spent while not on TAD

There is an apparent relationship between the length of an overseas trip and the availability ratio (MHAW/MHTOT). As trip lentgh increases, this factor also increases up to a point of 21.9 days after which it levels off. This relationship is illustrated in the graph contained in Figure VI-1. The overall rating of 85.1% (Table VI-5) compares with the overseas activities rating of 88.2%.

In our sample of inspection data we found the actual manhours expended by inspectors an average of 160% greater than the standard manhours listed by the Coast Guard for the particular inspections (Table VI-6). There was also a significant decrease in the rank of the persons conducting the inspections over time. In 1981, 73.3% of the persons conducting the overseas inspections were Lieutenants (0-3) and above. However in 1983 only 48.9% of the inspectors fell in this range. The average time between the completion date of an inspection and the date the company gets billed has decreased from 181.8 days in 1981 to 160 days in 1983.

Finally, it was noted that the Far East was the area most visited by Coast Guard inspectors in carrying out the overseas inspection program. This area accounted for 54.6% or 626 overseas visits. See table VI-7 for a breakdown of visits by major geographic area. Additional tables and charts are contained in Appendix C.

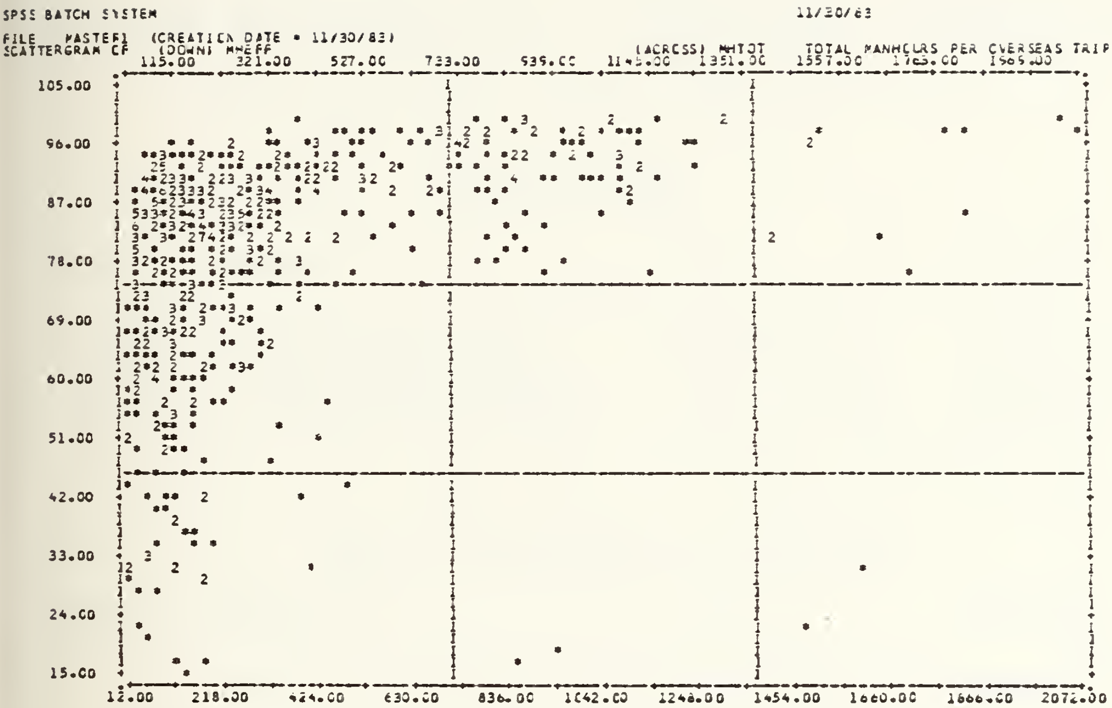
Table VI-5

Availability Ratio (MHAW/MHTCT) By District Offices (%)

Dist/office	Mean	Dist/office	Mean
Boston -----	91.6	Honolulu -----	87.2
St Louis -----	93.4	Juneau -----	82.3
New York -----	83.6	Headquarters ----	88.0
Norfolk -----	89.3	Rotterdam -----	81.2
Miami -----	81.2	Singapore -----	66.1
New Orleans --	71.9	Kobe -----	91.1
Cleveland ----	84.7	Guam -----	88.8
LA/Long Beach -	88.5	Rio Koje -----	94.3
San Francisco -	86.9	Rio Chiba -----	68.0
Seattle ------	75.3		

Entire Population -- 85.1

Figure VI-1



SPSS BATCH SYSTEM
11/30/83
FILE MASTER1 (CREATION DATE = 11/30/83)
SCATTERGRAM OF (DOWN) MHEFF
(ACROSS) MHTOT TOTAL MANHOURS PER OVERSEAS TRIP
115.00 321.00 527.00 733.00 1351.00 1557.00
105.00
96.00
87.00
78.00
69.00
60.00
51.00
42.00
33.00
24.00
15.00
12.00 218.00 630.00 1454.00 2072.00

Table VI-6

Mean Actual Manhours as
Percentage of Standard Manhours

Cargo Vessels

Type of Inspection:	COI	COI/DD
< 300 gross tons	181.7% (18)	198.9% (46)
300-19,999 gross tons	178.3% (46)	128.3% (12)
20,000 gross tons	162.9% (12)	127.6% (3)

Tank Vessels

Type of Inspection:	COI	COI/DD
1000-19,999 gross tons	61.0% (12)	114% (8)
20,000-39,999 gross tons	165.0% (2)	103.1% (3)
40,000-74,999 gross tons	* (0)	211.5% (1)
75,000-124,999 gross tons	92.0% (1)	238.4% (1)

Mobile Offshore Drilling Units

Type of Inspection:	COI	COI/DD
	94.5% (8)	123.9% (9)

Liquified Natural Gas Carriers

Type of Inspection:	COI	COI/DD
	59.5% (1)	134.8% (5)

NOTE:

Number in parenthesis represents actual number of vessels in that particular category in sample population.

Table VI-7

Inspections Location

Area	Number of visits	% Total
Africa	34	7.3
Europe	196	17.3
Far East	626	54.6
North America	92	8.0
South America	94	8.2
Mideast	21	1.8
Others	33	2.9

Table VI-8

Mean Trip Length by Districts/Offices

Dist/Office	FY81 MTL (days)	FY82 MTL (days)	FY83 MTL (days)
Boston	13.3	13.9	6.3
St Louis	---	14.5	40.6
New York	8.8	12.0	16.4
Norfolk	20.8	36.4	32.1
Miami	8.8	12.8	42.7
New Orleans	10.6	9.6	8.5
Cleveland	4.8	---	26.7
LA/Long Beach	21.8	54.2	49.6
San Francisco	25.0	17.5	21.6
Seattle	33.1	16.4	13.9
Honolulu	8.8	28.9	35.1
Juneau	18.6	---	24.0
Headquarters	19.2	14.3	---
Rotterdam	4.9	6.8	---
Singapore	3.5	3.7	---
Kobe	9.0	13.6	---
Guam	---	3.5	---
Rio Koje	42.4	15.6	---
Rio Chiba	---	2.4	---
Entire Population	11.8	13.8	19.2

Table VI-9

TAD Manhours Allocated by Districts/Offices

Dist/Offices	FY 81	%	FY 82	%	FY 83*	%
Boston	6367.8	9.0	3343.4	3.8	2409.4	3.5
St Louis	-----	0.0	348.0	0.4	2925.0	4.3
New York	2739.6	3.9	12977.9	14.8	23170.2	33.8
Norfolk	3001.1	4.2	873.0	1.0	1539.8	2.2
Miami	2112.3	3.0	1534.4	1.7	1024.9	1.5
New Orleans	5077.2	7.2	12495.5	14.3	4092.5	6.0
Cleveland	230.5	0.3	----	0.0	1283.5	1.9
LA/Long Beach	3666.5	5.2	3900.0	4.5	3573.0	5.2
San Francisco	14418.1	20.4	10919.1	12.5	2589.1	3.8
Seattle	1591.0	2.2	2754.5	3.1	3661.0	5.3
Honolulu	632.8	0.9	19408.9	12.5	21087.5	30.8
Juneau	1339.1	1.9	-----	0.0	1152.0	1.7
Headquarters	3681.9	5.2	1032.5	1.1	-----	---
Rotterdam	8331.0	11.8	4885.9	5.6	-----	---
Singapore	170.0	0.2	353.8	0.4	-----	---
Kobe	11260.0	15.9	9787.5	11.2	-----	---
Guam	-----	0.0	84.3	0.1	-----	---
Rio Koje	6104.6	8.6	2247.3	2.6	-----	---
Rio Chiba	-----	0.0	574.5	0.7	-----	---
Total	70723.5	99.9	87520.5	100	68508.5	100

* only first two quarters of 83 analyzed

Table VI-10

Comparison of Quarterly TAD Manhours

MIO New York:

Qtr	Total Manhours	% of Total	% Change
3-82	7281.6	44.7	2930.8
4-82	5062.6	17.3	-30.5
1-83	10519.0	28.3	107.0
2-83	12651.2	40.5	20.3

MSC Honolulu:

Qtr	Total Manhours	% of Total	% Change
3-82	2491.1	15.3	-42.3
4-82	10012.8	34.2	302.0
1-83	11796.1	31.7	17.8
2-83	9291.5	29.7	-21.2

Table VI-10 shows the recent quarterly TAD manhours expended by the two major offices participating in overseas CVS inspections. While there are significant fluctations in the quarterly amounts for both offices, the fluctuations are greater under MIO New York. Fluctuations in demand within a period of one year to the extent indicated in this table pose scheduling and planning problems and make it difficult to project necessary force levels at these units.

VII. EVALUATION OF ALTERNATIVES

A. EVALUATION OF QUANTIFIED FACTORS

The ratios of cost to effectiveness for each alternative; under their respective fiscal quarters and for the effectiveness model and each of the three variations included; are listed in table VII-1. The quarterly operating costs are taken from table IV-9. The effectiveness scores are taken from table V-4. In evaluating these ratios, it should be noted that numbers of smaller magnitude are desired. Referring to the table, the ratios attributable to alternative one are clearly superior to those attributable to alternative two. The best, worst and average scores obtained from each of the four formulas indicate a consistent improvement in score when the overseas offices are closed. This is true even when the unusually low values for quarter 382 are excluded.

In comparing the results of the formulas listed in table VII-1, there is a general increase in effectiveness scores and a resulting decrease in the ratios under formulas 3 and 4 where actual manhours are compared to standard rather than average manhours. This is due to the fact that standard manhours were found to be consistently lower than average manhours for similar types of inspections within the sample.

Table VII-1

Cost Effectiveness Ratios

Qtr:	Effectiveness Formula:			
Alt 2	1	2	3	4
1-81	1546	1447	1306	1307
2-81	1760	1714	1656	1650
3-81	2669	2378	2035	2026
4-81	2252	2083	1935	1903
1-82	2375	2117	1796	1795
2-82	1715	1677	1496	1540
Best	1546	1447	1306	1307
Worst	2669	2378	2035	2026
Average	2053	1903	1704	1704
Alt 1				
3-82	424	472	379	436
4-82	929	1121	1053	1037
1-83	1051	1081	962	1020
2-83	1097	1083	958	994
Best	424	472	379	436
Worst	1097	1121	1053	1037
Average	875	939	838	872

The use of equal weighting factors in formulas 2 and 4, instead of the assigned weights, also had the effect of increasing effectiveness scores, although to a lesser degree. The use of equal weighting factors in the model also decreased the variability resulting from a decrease in the weight assigned to actual manhours which was found to generate most of the variability in scores.

There are improvements in the effectiveness scores in most cases under alternative number one. The effectiveness scores for alternative one are equal to or greater than 95 in three of the four quarters measured using the basic model, and the average score of the four quarters is above 100. A score of 95 or above is assumed to be within acceptable limits. The effectiveness scores for alternative one are equal to or greater than 95 in 13 of the 16 cases measured when including the three variations of the model. This is compared to a number of 12 out of 24 cases under alternative two having a score of 95 or better.

The comparison of quantified cost and effectiveness factors therefore leads one to conclude that the overseas CVS offices should remain closed. There is, however, one factor which should be considered in the evaluation of effectiveness scores. When the overseas offices were open during fiscal 1981 and the first half of fiscal 1982, the portion of overseas TAD inspections carried out by foreign based personnel was about one third of the total performed. This

average is based on the amounts of TAD manhours available for work (MHAW) expended by personnel attached to U.S. and foreign offices during that period. The effectiveness scores for each quarter were therefore weighted in favor of the scores attributable to inspections conducted by U.S. based personnel in accordance with the mix of inspections performed during each quarter. Even though most of the manhours allotted to the foreign based personnel were spent on TAD inspections, their portion of the total inspections averaged one third of the total. This means that the closure of the overseas offices had a relatively minor effect on the overall method of conducting overseas CVS activities. This also means that the effectiveness model essentially measured the quality of overseas inspections conducted by U.S. based personnel under both alternatives. As a result, the recent improvements in effectiveness scores may be more appropriately attributed to a general improvement in the quality of inspections rather than to the closure of the overseas offices. This factor also leads to the conclusion that the level of personnel stationed overseas would have to be greatly increased if the offices were to be reopened and if they were to be expected to accomplish a more substantial portion of the workload. In closing, we feel it is important to note that there were some substantial differences in effectiveness scores obtained under alternative two between

inspections conducted by U.S. and foreign based personnel. In quarters 3-81 and 1-82 the scores for inspections conducted by foreign based personnel were 100.2 and 92.11 respectively. The scores for inspections conducted by U.S. based personnel for the same quarters and using formula one were 56.32 and 52.25 respectively, a decrease of over 40%. There was also one quarter where a score of 100 for inspections performed by U.S. based personnel was almost 15% better than that of inspections by foreign based personnel.

E. ASSESSMENT OF NON-QUANTIFIED FACTORS

As discussed in chapter two, quantifiable factors tend to take precedence over non-quantifiable factors. Decisions are sometimes based on insignificant factors that can be measured with precision, while the crucial unmeasurables are neglected. It is the purpose of this section to address some of the non-quantifiable issues that have an impact on the cost-effectiveness of overseas inspection alternatives.

Information gathered by headquarters planning personnel from several major inspection/safety offices highlighted several key areas:

1) Personal Safety - Safety and security are day by day watchwords. Respect for human life, especially in the Far East, is considerably less than in Western nations. No formal procedures are currently in place to handle medical emergencies for TAD inspectors.

2) Logistics - The workplace for the inspectors is as diverse as can be imagined. Each area has its own language, culture, standard of living, transportation and communication problems. The "Fly American Policy" increases the complexity of scheduling and increases the lost time due to travel.

3) Language and Culture Differences - Inspectors experience numerous problems due to unfamiliarity with laws of country as well as customs. Several countries do not allow unaccompanied women. This is a sensitive issue that reduces the options available to office managers and creates inequitable distribution of assignments in offices with female inspectors.

4) Personal Financial Burden - There is a problem in drawing sufficient amounts of advance for travel and per diem. The maximum limits vary from $250 to $500. Our data indicated thatthe mean amounts billed are substantially higher than these limits. It is considered that per diem rates are sufficient in the large cities where higher rates have been established. In the towns near the shipyards rates have often not been established so the minimum rate of $50 a day is in effect. This is usually insufficient to cover expenses.

The above issues, coupled with longer durations of overseas trips and erratic separation in some instances from dependents, are likely to have an adverse effect on morale.

During August of 1983, a total of 43 letters were sent to various maritime organizations which were found to have a number of recurring overseas inspections. The letters were designed to solicit narrative remarks in several broad areas concerning effects on operations resulting from the recent delegation of authority to the American Bureau of Shipping, and the closure of the overseas CVS offices. A total of 12 companies responded to our letter. Of the 12, four are involved in the operation of offshore supply vessels, five own or operate mobile offshore drilling units and three own or operate freightships or tankships engaged in overseas shipping.

While all of the respondents indicated that the closure of the overseas offices did not have an effect on the amount of periodic inspections requested overseas, there were some misgivings concerning the recent changes. In our discussion of the responses, several comments made by responding companies will be quoted. The type of company will be described, but we feel the identity of a company need not be disclosed.

The respondents which own or operate offshore supply vessels identified the cost of the reimbursements made to the Coast Guard for overseas inspections as an economic hardship. One company remarked: "The main disadvantages we have discovered since the closing of the U.S.C.G. overseas offices, have been economic in nature, with the high cost of

travel, per diem and related expenses topping the list." Another company referred to problems involving costs and inspector consistency.

> "Obviously the closure has had an adverse financial impact and has created problems that affect our satisfaction with inspection functions. One significant problem has been in inspector consistency. Many offices have had to draw inspectors from wherever they could find them. A number of these individuals were inexperienced and not adequately prepared to operate alone in a remote location. This indicated to us that the Coast Guard was operating in an overload condition."

One of the five respondents which own or operate mobile offshore drilling units cited problems in scheduling for TAD inspectors while the other four reported no significant delays or problems in this area. Two of the five companies identified problems involving the competency of travelling inspectors. One of these companies remarked that their level of satisfaction had decreased since the closure of the overseas offices. "...the overseas offices, particularly Rotterdam and Singapore, were staffed with personnel experienced in the offshore drilling industry. They understood the vast differences between a drilling rig and a ship. They were also familiar with problems particular to overseas operations." A second company stated: "There seems to be fewer competent inspectors, and the inspectors that are available are generally stretched so thin they cannot devote the time necessary for each vessel." This company also pointed out that communications between an inspector and his home office, which are sometimes needed to resolve problems

or disputes, are adversely affected by the long distances travelled. They recommended that the Coast Guard should reopen the foreign offices or delegate more functional authority to the American Bureau of Shipping or other agencies that are more available overseas. A third company replied that continuity in foreign shipyards is now practically nonexistent. It is interesting to note that companies involved in the operation of offshore supply vessels were concerned with the costs of inspections, while companies involved in the operation of mobile offshore drilling units were more concerned with the competency of the inspectors.

Another problem pointed out by several of the respondents involved the nonavailability of inspectors for special inspections to correct prior deficiencies or for shop inspections of approved safety or life-saving equipment overseas. One company made the following comments in this area:

> "Liferaft servicing/inspections are a major problem in some areas. Since we cannot afford to shuttle Coast Guard personnel around the world, we have tried to use the approved third party inspection procedure. However, many of the areas in which we operate do not have U.S.C.G. approved facilities. We are, therefore faced with the choice of keeping rafts onboard past the inspection date or shipping them out of the country which takes from 3 to 6 months. As regards outstanding deficiencies, the item would have to be extremely grave to warrant the cost of a second inspection trip. We try to assure the cognizant OCMI via written confirmation of compliance. To date, we have received a fair response to this procedure."

The responses generally indicated that from the perspective of these companies, several problem areas have arisen as a result of the closure of the overseas offices. Problem areas include such factors as scheduling, availability of inspectors, the competency of TAD inspectors, communications and the continuity of enforcement policies. These same problem areas have concerned CVS program managers. It is, of course, not known whether the perceptions of those companies who did not respond, and others, would substantiate the comments received or not.

C. PENDING LEGISLATION

There are several bills before Congress that if enacted will have significant impact upon overseas inspection activities. One of these bills is the Merchant Marine Act of 1983, an administration bill, to amend the Merchant Marine Act of 1936 to extend to U.S. flagship operators authority to construct, reconstruct, or acquire ships outside the U.S. without forfeit of eligibility for operating differential subsidies. If implemented it will most likely increase the manhours allocated to overseas inspections. Charles I. Hiltzheimer, Chairman and Chief Executive Officer, of Sea-Land Industries Investment Inc., during congressional testimony, suggested a revision to the act that would permit non-subsidized U.S. flag operators to use tax deffered capital construction funds for acquistion of foreign-built

vessels. This revision would tend to increase the size of the U.S. fleet.

Finally, implementation of the Cargo Preference Act would require Federal agencies engaged in commodity export and import by ship to transport at least 50% of cargoes by U.S. flag vessels. The short term impact of this bill is dependent upon the utilization of existing capacity. The long term impact would be an increase in workload concerning periodic inspections of the U.S. fleet.

D. RECOMMENDATIONS

The following recommendations are offered as a result of this analysis:

1. That further research be conducted in the area of estimating, measuring and evaluating the effectiveness of CVS activities. This includes the formulation of relevant effectiveness models or measures such as the one used in this analysis and the design of proper procedures to validate them. Contrary to the views expressed in the CVS Operating Program Plan for fiscal years 85-94 that there are no accurate quantitative measures of effectiveness; and that effectiveness must be inferred from changes in accident rates; we feel that workable methods of measuring effectiveness can be devised that are not necessarily predicated on safety records.

2. The Coast Guard should formulate a strategy, goals and objectives that are more specifically tailored to overseas CVS activities. In this effort, a projection of future demands for our services, the impacts of pending legislation and the desires of internal decision-makers and our constituents should be considered. Costs resulting from travel time and billing delays are to a great extent dependent upon overseas workload. Substantial increases in future workloads due to changes in the legal or economic environment could result in significant increases in these costs and, therefore, increase the desirability of reopening some level of overseas facilities.

3. In the event that the overseas offices are reopened, alternative methods of recovering operating expenses incurred should be explored. An equitable means of allocating office operating expenses to the parties that more directly benefit from their services would be an area of concern.

4. The Coast Guard should evaluate whether or not it would be beneficial to provide some level of language training for CVS personnel. This training could be designed to acquaint an inspector with some of the basic language and cultural differences and better prepare these personnel for situations involving medical and other emergencies.

5. The policies concerning limits on the amounts of advance funds which may be drawn by inspectors should be reevaluated. Essentially, this would involve an effort to remove financial

burdens which in some cases are placed on personnel in situations involving especially long trips or trips to high cost areas. Appropriate policies in this area are increasingly important because both the number and length of overseas trips have increased since 1981.

APPENDIX A: COST AND MANHOUR DATA AND COMPUTER PROGRAM

```
FILE: MASTER2   SPSS      APPENDIX A

FILE NAME       MASTER1
VARIABLE LIST   DIST,YR,QTR,MONTH,RANK,AMTB,DUMA,BDBD,BDCD,
                MHAW,MHLT,MHTOT,DUMB
INPUT FORMAT    FIXED (F2.0,2X,F2.0,2X,F3.0,2X,F4.0,2X,F2.0,2X,F8.2,1X,
                F1.0,1X,F3.0,1X,F3.0,2X,F7.2,2X,F7.2,2X,F7.2,2X,F1.0)
N OF CASES      1283
INPUT MEDIUM    CARD
VAR LABELS      DIST,COAST GUARD DISTRICT/
                YR,FISCAL YEAR OF INSPECTION/
                QTR,QUARTER AND FISCAL YEAR/
                MONTH,MONTH AND YEAR OF INSPECTION/
                RANK,RANK OF INSPECTOR/
                AMTB,AMOUNT BILLED/
                DUMA,DUMMY VARIABLE ONE/
                BDBD,BILLING DATE BIGINNING DATE/
                BDCD,BILLING DATE COMPLETION DATE/
                MHAW,MANHOURS AVAILABLE FOR WORK/
                MHLT,MANHOURS LOST TO TRAVEL/
                MHTOT,TOTAL MANHOURS PER OVERSEAS TRIP/
                DUMB,DUMMY VARIABLE TWO/
READ INPUT DATA
31   81   181   1080   03      712.76 1 125 121     84.50     25.25    109.75  2
31   81   181   1180   03     2573.33 1 134 116    168.00     24.00    192.00  2
31   81   181   1180   03     3037.90 1 116 109    161.00     44.00    205.00  2
31   81   181   1180   03      148.86 1 112 109     78.50     10.20     88.70  2
31   81   181   1180   03      723.56 1 104 100    144.20     24.50    168.70  2
31   81   181   1180   03     1537.53 1 100 097   0000.00   0000.00   0000.00  0
31   81   181   1180   03      572.26 1 103 102     22.00     16.80     38.80  2
31   81   181   1180   03      819.73 1 103 096    119.00     52.00    171.00  2
31   81   181   1280   03      760.30 1 092 087    109.25     22.75    132.00  2
31   81   181   1280   05     2537.79 1 105 101     94.50     37.20    131.70  2
31   81   181   1280   03       52.13 1 087 087      9.25      7.00     16.25  2
31   81   181   1280   03      682.76 1 084 083     26.50      6.00     32.50  2
31   81   181   1280   03     2810.18 1 095 086    159.75     44.75    204.50  2
31   81   181   1280   03     2078.73 1 091 085    114.70     32.50    147.20  2
31   81   281   0181   03      534.49 1 142 142      7.00      5.75     12.75  2
31   81   281   0181   03      776.08 1 141 137     82.75     17.95    100.70  2
31   81   281   0181   03      115.00 1 140 138     51.50      7.00     58.50  2
31   81   281   0281   03      115.00 1 112 110     53.00      6.00     59.00  2
31   81   281   0181   03       40.33 1 298 292    134.00     24.70    158.70  2
31   81   281   0181   03     1148.27 1 124 118   0000.00   0000.00   0000.00  0
31   81   281   0281   03      368.92 1 113 112     30.30      6.70     37.00  2
31   81   281   0281   03     1918.22 1 108 096    170.00     74.50    244.50  2
31   81   281   0281   03     2681.03 1 104 094    181.50     54.00    235.50  2
31   81   281   0281   03      141.10 1 104 094   0000.00   0000.00   0000.00  0
31   81   281   0281   03     1014.75 1 111 108    111.75     20.25    132.00  2
31   81   281   0281   03      275.69 1 111 106   0000.00   0000.00   0000.00  0
31   81   281   0381   03       80.44 1 107 106     31.00      5.50     36.50  2
31   81   281   0381   03      576.70 1 084 079    120.50     14.75    135.25  2
31   81   281   0381   03     2506.14 1 094 093    156.75     66.00    222.75  2
31   81   281   0381   03      278.46 1 094 093   0000.00   0000.00   0000.00  0
31   81   281   0381   05      586.08 1 086 081    101.50     31.75    133.25  2
31   81   281   0381   03      560.02 1 085 080    115.50      8.00    123.50  2
31   81   281   0381   04       80.90 1 084 083     28.50      8.25     36.75  2
31   81   381   0481   03       70.00 1 077 076     27.75      9.25     37.00  2
31   81   281   0381   04      495.68 1 082 079     74.50     10.00     84.50  2
31   81   281   0381   05      417.31 1 084 084      5.75      7.25     13.00  2
31   81   381   0481   03     2397.76 1 294 287    135.50     27.75    163.25  2
31   81   381   0481   03      641.66 1 287 283     96.70     11.80    108.50  2
31   81   381   0481   03      392.16 1 099 096     69.25     10.50     79.75  2
31   81   381   0481   05      719.60 1 099 092    159.50     19.50    175.00  2
31   81   381   0581   03     3974.55 1 067 056     67.00    129.00    196.00  2
31   81   381   0481   03      350.65 1 095 091    192.50     49.80    242.30  2
31   81   381   0481   03     1091.52 1 095 091   0000.00   0000.00   0000.00  0
31   81   381   0581   03     1025.23 1 087 083     93.50     19.25    112.75  2
31   81   381   0581   03     2191.66 1 085 078    143.50     29.00    172.50  2
31   81   381   0581   04      895.94 1 073 068    116.4      11.40    127.80  2
31   81   381   0581   05      142.01 1 215 213     40.50     15.20     55.70  2
31   81   381   0681   03       33.46 1 166 166      7.30      6.95     14.25  2
31   81   381   0681   03      995.19 1 095 095     96.75     15.05    111.80  2
31   81   381   0681   03     1287.34 1 093 089    184.50     82.25    266.75  2
31   81   381   0681   03     1930.00 1 088 082   0000.00   0000.00   0000.00  0
```

31	81	381	0681	03	644.13	1	085	082	71.00	15.75	86.75	2
31	81	481	0781	04	478.01	1	078	075	69.25	11.50	80.75	2
31	81	381	0681	05	567.23	1	173	170	70.25	10.25	80.50	2
31	81	381	0681	04	653.53	1	173	173	5.00	11.25	16.25	2
31	81	481	0781	03	376.00	1	141	131	236.50	17.75	254.25	2
31	81	481	0881	03	641.79	1	112	101	140.25	27.00	167.25	2
31	81	481	0881	03	665.59	1	105	103	54.00	7.25	61.25	2
31	81	481	0981	03	568.09	1	098	091	168.00	15.00	183.00	2
30	81	181	1180	03	2625.91	1	172	153	431.25	27.25	458.50	2
30	81	181	1080	04	632.30	1	230	221	183.00	30.50	213.50	2
30	81	381	0481	03	2039.89	1	255	247	153.50	35.25	188.75	2
30	81	381	0581	05	506.23	1	054	050	73.00	33.00	106.00	2
30	81	381	0581	05	337.49	1	054	050	0000.00	0000.00	0000.00	0
30	81	381	0681	04	278.39	1	277	258	414.25	45.05	459.30	2
30	81	381	0681	04	2459.13	1	277	258	0000.00	0000.00	0000.00	0
30	81	381	0681	04	1206.37	1	277	258	0000.00	0000.00	0000.00	0
30	81	381	0681	04	324.79	1	277	258	0000.00	0000.00	0000.00	0
30	81	381	0681	04	371.20	1	277	258	0000.00	0000.00	0000.00	0
30	81	481	0881	06	5954.43	1	361	331	678.00	58.60	736.60	2
30	81	481	0881	04	4286.49	1	410	382	597.00	70.75	667.75	2
30	81	281	0181	03	160.41	1	232	197	769.00	82.50	851.50	2
30	81	281	0181	03	695.09	1	232	197	0000.00	0000.00	0000.00	0
30	81	281	0181	03	588.15	1	232	197	0000.00	0000.00	0000.00	0
30	81	281	0181	03	267.34	1	232	197	0000.00	0000.00	0000.00	0
30	81	281	0181	03	160.41	1	232	197	0000.00	0000.00	0000.00	0
30	81	281	0181	03	3475.45	1	232	197	0000.00	0000.00	0000.00	0
01	81	181	1180	22	2895.04	1	178	143	836.00	10.20	846.20	2
01	81	181	1180	23	746.08	1	157	143	136.00	18.45	154.45	2
01	81	281	0181	22	3979.87	1	161	060	764.75	7.75	772.50	2
01	81	281	0381	22	00000.00	0	000	000	957.35	32.10	989.45	2
01	81	281	0281	24	312.30	1	111	110	19.50	10.50	30.00	2
01	81	281	0381	24	602.77	1	139	134	67.25	10.00	77.25	2
01	81	381	0481	05	292.18	1	112	110	42.75	12.00	54.75	2
01	81	381	0681	23	470.36	1	093	090	71.60	12.40	84.00	2
01	81	481	0881	04	939.13	1	199	164	604.00	175.00	779.00	2
01	81	481	0881	04	1869.83	1	199	164	0000.00	0000.00	0000.00	0
01	81	481	0881	04	1402.36	1	199	164	0000.00	0000.00	0000.00	0
01	81	481	0981	24	178.53	1	134	131	51.25	31.05	82.30	2
03	81	281	0381	22	718.82	1	138	131	132.60	23.40	156.00	2
03	81	281	0381	04	132.00	1	112	105	45.00	44.60	89.60	2
03	81	281	0381	04	223.00	1	098	095	0000.00	0000.00	0000.00	0
03	81	381	0581	22	228.38	1	154	151	169.00	106.00	275.00	2
03	81	381	0681	03	709.35	1	112	109	30.00	142.00	172.00	2
03	81	381	0681	03	292.38	1	110	108	19.50	52.75	72.25	2
03	81	381	0681	22	180.92	1	118	107	219.00	42.25	261.25	2
03	81	481	0881	02	1248.23	1	268	252	129.00	273.00	402.00	2
03	81	481	0881	23	980.35	1	072	059	350.40	123.35	473.75	2
03	81	481	0881	22	72.48	1	072	059	64.00	15.75	79.75	2
03	81	481	0981	04	178.36	1	203	196	144.00	32.50	176.50	2
05	81	181	1080	05	3385.00	1	243	217	525.50	66.00	591.50	2
05	81	181	1180	12	705.18	1	161	155	137.00	20.00	157.00	2
05	81	281	0281	11	3239.50	1	129	117	196.95	108.05	305.00	2
05	81	281	0381	03	1702.93	1	481	442	699.90	142.10	842.00	2
05	81	281	0381	03	1070.42	1	481	442	0000.00	0000.00	0000.00	0
05	81	281	0381	03	2092.17	1	481	442	0000.00	0000.00	0000.00	0
05	81	281	0381	03	27.20	1	481	442	0000.00	0000.00	0000.00	0
05	81	481	0781	04	4749.30	1	112	091	462.50	57.10	519.60	2
05	81	281	0281	04	1739.31	1	230	206	518.95	67.05	586.00	2
05	81	281	0281	04	1278.57	1	230	206	0000.00	0000.00	0000.00	0
05	81	281	0281	04	1596.30	1	230	206	0000.00	0000.00	0000.00	0
07	81	381	0481	02	262.50	1	302	300	55.20	6.30	61.50	2
07	81	381	0481	04	388.30	1	154	126	100.00	5.00	105.00	2
07	81	381	0581	22	833.20	1	126	124	34.25	12.75	47.00	2
07	81	381	0581	03	3206.02	1	418	390	598.00	77.00	675.00	2
07	81	381	0581	22	187.00	1	360	359	32.50	4.00	36.50	2
07	81	381	0581	05	564.55	1	171	169	30.25	5.75	36.00	2
07	81	381	0681	24	527.64	1	267	265	32.25	18.25	50.50	2
07	81	381	0681	02	535.84	1	403	402	16.30	19.95	36.25	2
07	81	281	0281	02	269.35	1	213	177	700.50	174.05	874.55	2
07	81	281	0281	02	1077.38	1	213	177	0000.00	0000.00	0000.00	0
07	81	281	0281	02	161.60	1	213	177	0000.00	0000.00	0000.00	0
07	81	281	0281	02	538.69	1	213	177	0000.00	0000.00	0000.00	0

07	81	281	0281	02	3124.40	1	213	177	0000.00	0000.00	0000.00	0
07	81	281	0281	02	215.48	1	213	177	0000.00	0000.00	0000.00	0
07	81	381	0481	22	1933.09	1	175	167	173.50	16.50	190.00	2
08	81	181	1180	03	331.30	1	229	218	155.85	221.15	377.00	2
08	81	181	1180	03	33.28	1	202	200	36.75	19.50	56.25	2
08	81	281	0181	04	79.32	1	167	162	107.50	26.50	134.00	2
08	81	281	0181	22	84.68	1	114	108	56.50	101.50	158.00	2
08	81	281	0181	03	979.50	1	189	177	252.05	38.95	291.00	2
08	81	281	0281	03	92.20	1	169	164	76.00	43.65	119.65	2
08	81	281	0381	03	612.03	1	097	093	54.00	97.75	151.75	2
08	81	381	0481	03	931.22	1	061	049	273.25	28.00	301.25	2
08	81	381	0581	03	154.71	1	084	081	67.60	13.55	81.15	2
08	81	381	0681	03	2670.60	1	120	108	120.00	56.05	176.05	2
08	81	481	0781	03	1682.66	1	109	099	112.50	39.25	151.75	2
08	81	481	0881	05	92.76	1	292	210	488.75	1112.75	1601.50	2
08	81	481	0881	05	2049.15	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	931.44	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	1247.58	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	186.29	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	1676.58	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	372.57	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	149.19	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	186.29	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	186.29	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	05	656.61	1	292	210	0000.00	0000.00	0000.00	0
08	81	481	0881	22	301.25	1	238	232	145.50	15.50	161.00	2
08	81	481	0981	22	608.83	1	200	196	69.00	12.50	81.50	2
08	81	481	0981	03	1893.04	1	250	234	182.10	35.82	217.92	2
08	81	481	0981	04	1593.18	1	250	235	153.90	40.96	194.86	2
08	81	481	0981	04	1357.16	1	250	235	131.10	34.89	165.99	2
08	81	481	0981	03	1262.02	1	250	234	121.40	23.88	145.28	2
09	81	381	0681	04	778.02	1	119	114	80.00	40.00	120.00	2
09	81	481	0881	22	749.43	1	064	062	72.00	38.50	110.50	2
11	81	381	0581	24	146.20	1	140	138	12.50	48.00	60.50	2
11	81	381	0581	05	3647.92	1	444	411	660.50	143.50	804.00	2
11	81	381	0581	05	972.72	1	444	411	0000.00	0000.00	0000.00	0
11	81	381	0581	05	243.20	1	444	411	0000.00	0000.00	0000.00	0
11	81	481	0881	03	1901.10	1	293	285	120.75	76.25	197.00	2
11	81	281	0381	04	880.39	1	281	280	26.35	4.65	31.00	2
11	81	281	0181	03	651.13	1	232	197	795.50	54.00	849.50	2
11	81	281	0181	03	2474.28	1	232	197	0000.00	0000.00	0000.00	0
11	81	281	0181	03	217.04	1	232	197	0000.00	0000.00	0000.00	0
11	81	281	0181	03	86.82	1	232	197	0000.00	0000.00	0000.00	0
11	81	281	0181	03	737.94	1	232	197	0000.00	0000.00	0000.00	0
11	81	281	0181	03	173.63	1	232	197	0000.00	0000.00	0000.00	0
11	81	181	1180	04	316.99	1	294	267	605.75	27.75	633.50	2
11	81	181	1180	04	352.21	1	294	267	0000.00	0000.00	0000.00	0
11	81	181	1180	04	633.97	1	294	267	0000.00	0000.00	0000.00	0
11	81	181	1180	04	1091.84	1	294	267	0000.00	0000.00	0000.00	0
11	81	181	1180	04	1127.07	1	294	267	0000.00	0000.00	0000.00	0
11	81	181	1180	24	420.65	1	294	249	1037.00	54.00	1091.00	2
11	81	181	1180	24	2043.18	1	294	249	0000.00	0000.00	0000.00	0
11	81	181	1180	24	180.28	1	294	249	0000.00	0000.00	0000.00	0
11	81	181	1180	24	120.19	1	294	249	0000.00	0000.00	0000.00	0
11	81	181	1180	24	420.65	1	294	249	0000.00	0000.00	0000.00	0
11	81	181	1180	24	540.84	1	294	249	0000.00	0000.00	0000.00	0
11	81	181	1180	24	120.19	1	597	552	0000.00	0000.00	0000.00	0
11	81	181	1180	24	1622.52	1	588	543	0000.00	0000.00	0000.00	0
11	81	181	1180	24	180.28	1	294	249	0000.00	0000.00	0000.00	0
11	81	181	1180	24	360.56	1	294	249	0000.00	0000.00	0000.00	0
12	81	281	0281	02	3475.87	1	128	109	429.00	35.50	464.50	2
12	81	281	0381	03	708.69	1	141	130	174.00	46.00	220.00	2
12	81	281	0381	03	2126.06	1	141	130	0000.00	0000.00	0000.00	0
12	81	381	0481	12	2512.41	1	224	216	108.50	86.50	195.00	2
12	81	381	0481	03	1583.89	1	328	289	797.50	43.50	841.00	2
12	81	381	0481	03	3590.16	1	328	289	0000.00	0000.00	0000.00	0
12	81	381	0481	03	105.59	1	328	289	0000.00	0000.00	0000.00	0
12	81	381	0581	03	4123.29	1	375	328	1085.00	41.00	1126.00	2
12	81	381	0581	03	147.26	1	375	328	0000.00	0000.00	0000.00	0
12	81	381	0581	03	1619.86	1	375	328	0000.00	0000.00	0000.00	0
12	81	381	0581	03	441.79	1	375	328	0000.00	0000.00	0000.00	0
12	81	381	0581	03	1030.83	1	375	328	0000.00	0000.00	0000.00	0

12	81	381	0581	03	1117.11	1	306	296	198.80	41.20	240.00	2
12	81	381	0581	03	1622.65	1	306	296	0000.00	0000.00	0000.00	0
12	81	381	0681	04	3512.78	1	406	388	389.50	44.50	434.00	2
12	81	381	0681	23	2673.30	1	283	236	1107.00	25.00	1132.00	2
12	81	381	0681	23	2472.40	1	283	236	0000.00	0000.00	0000.00	0
12	81	381	0681	23	1537.50	1	283	236	0000.00	0000.00	0000.00	0
12	81	381	0681	23	36.80	1	318	271	0000.00	0000.00	0000.00	0
12	81	381	0681	23	59.20	1	318	271	0000.00	0000.00	0000.00	0
12	81	381	0681	23	64.00	1	318	271	0000.00	0000.00	0000.00	0
12	81	381	0681	04	542.21	1	367	356	182.50	82.00	264.50	2
12	81	481	0781	04	779.20	1	234	210	542.75	39.65	582.40	2
12	81	481	0781	05	397.20	1	158	153	92.80	30.20	123.00	2
12	81	481	0781	02	573.99	1	268	231	700.50	34.50	735.00	2
12	81	481	0781	02	2295.94	1	268	231	0000.00	0000.00	0000.00	0
12	81	481	0781	02	573.98	1	268	231	0000.00	0000.00	0000.00	0
12	81	481	0781	02	1147.97	1	268	231	0000.00	0000.00	0000.00	0
12	81	481	0781	05	2466.58	1	312	305	138.00	33.00	171.00	2
12	81	481	0781	03	6885.60	1	314	272	967.50	42.75	1010.25	2
12	81	481	0981	04	4246.24	1	188	148	918.00	44.50	962.50	2
12	81	481	0981	04	220.59	1	188	148	0000.00	0000.00	0000.00	0
12	81	481	0981	04	110.29	1	188	148	0000.00	0000.00	0000.00	0
12	81	481	0981	04	937.48	1	188	148	0000.00	0000.00	0000.00	0
12	81	481	0981	03	1613.60	1	155	151	37.00	55.25	92.25	2
12	81	481	0981	02	2510.76	1	198	191	151.00	19.25	170.25	2
12	81	481	0981	04	2599.65	1	402	395	119.50	47.00	166.50	2
12	81	281	0381	04	475.87	1	176	143	751.00	40.00	791.00	2
12	81	281	0381	04	634.49	1	176	143	0000.00	0000.00	0000.00	0
12	81	281	0381	04	2960.95	1	176	143	0000.00	0000.00	0000.00	0
12	81	281	0381	04	1216.11	1	176	143	0000.00	0000.00	0000.00	0
12	81	181	1280	04	735.02	1	265	228	678.00	16.00	694.00	2
12	81	181	1280	04	459.39	1	265	228	0000.00	0000.00	0000.00	0
12	81	181	1280	04	1883.48	1	265	228	0000.00	0000.00	0000.00	0
12	81	181	1280	04	183.75	1	265	228	0000.00	0000.00	0000.00	0
12	81	181	1280	04	826.89	1	265	228	0000.00	0000.00	0000.00	0
12	81	181	1280	04	505.32	1	265	228	0000.00	0000.00	0000.00	0
12	81	281	0281	03	1347.61	1	207	126	878.75	18.75	897.50	2
12	81	281	0381	03	1828.90	1	207	126	878.75	18.75	897.50	2
12	81	281	0281	03	6064.25	1	207	126	0000.00	0000.00	0000.00	0
12	81	281	0381	03	96.26	1	207	126	0000.00	0000.00	0000.00	0
12	81	281	0281	03	96.26	1	207	126	0000.00	0000.00	0000.00	0
12	81	281	0381	03	192.52	1	207	126	0000.00	0000.00	0000.00	0
13	81	481	0981	03	2439.29	1	223	187	707.15	108.85	816.00	2
13	81	481	0981	03	545.63	1	223	187	0000.00	0000.00	0000.00	0
13	81	481	0981	03	224.67	1	223	187	0000.00	0000.00	0000.00	0
13	81	481	0781	23	5619.07	1	597	565	690.50	84.50	775.00	2
17	81	481	0781	22	3230.40	1	094	070	494.00	93.30	587.30	2
17	81	181	1180	03	98.46	1	159	153	69.30	45.00	114.30	2
17	81	281	0281	03	1840.86	1	233	206	543.50	94.00	637.50	2
17	81	281	0281	03	1302.57	1	233	206	0000.00	0000.00	0000.00	0
17	81	281	0281	03	1674.81	1	233	206	0000.00	0000.00	0000.00	0
31	82	182	1181	03	1547.63	1	070	060	235.25	13.00	248.25	2
31	82	182	1281	05	1197.64	1	053	049	42.00	58.00	100.00	2
31	82	182	1281	03	524.87	1	052	050	17.20	34.80	52.00	2
31	82	182	1281	03	1180.21	1	106	101	81.00	33.25	114.25	2
31	82	182	1281	03	382.10	1	082	081	19.75	13.00	32.75	2
31	82	282	0182	04	309.15	1	075	074	22.00	3.50	25.50	2
31	82	282	0182	03	857.04	1	072	069	61.30	17.70	79.00	2
31	82	282	0182	03	2420.59	1	118	101	369.75	46.35	416.10	2
31	82	282	0382	05	370.51	1	055	052	66.50	8.50	75.00	2
31	82	282	0282	03	1745.13	1	242	234	112.70	71.00	183.70	2
31	82	282	0382	04	308.83	1	069	069	11.00	6.50	17.50	2
31	82	282	0282	04	295.52	1	101	101	10.60	5.35	15.95	2
31	82	282	0282	03	1399.97	1	234	223	188.50	86.00	274.50	2
31	82	282	0282	04	2505.99	1	089	077	235.00	53.75	288.75	2
31	82	282	0382	03	439.29	1	218	211	153.50	18.80	172.30	2
31	82	282	0382	03	406.04	1	141	134	0000.00	0000.00	0000.00	0
31	82	282	0382	03	12.00	1	072	069	64.25	10.25	74.50	2
31	82	282	0382	03	38.80	1	072	069	64.25	10.25	74.50	2
31	82	282	0382	03	2310.04	1	128	115	286.20	33.55	319.75	2
31	82	282	0382	03	1443.80	1	109	096	210.00	115.00	325.00	2
31	82	382	0482	03	515.07	1	081	076	67.50	55.50	123.00	2
31	82	382	0482	03	550.46	1	080	077	82.90	5.25	88.15	2

FILE: MASTER2 SPSS A NAVAL POSTGRADUATE SCHOOL

31	82	282	C382	04	390.06	1	087	086	31.00	5.75	36.75	2
31	82	382	C482	04	833.78	1	072	07C	42.90	17.10	6C.00	2
31	82	382	0582	03	2420.09	1	C59	049	229.75	26.80	256.55	2
31	82	382	C582	03	897.74	1	C85	073	274.75	21.05	295.80	2
30	82	482	C882	04	2295.47	1	C91	069	379.40	116.85	496.25	2
30	82	482	C882	04	918.18	1	091	069	0000.00	0000.00	000C.00	0
30	82	482	C882	04	1377.29	1	C91	069	0000.00	0000.00	00CC.00	0
30	82	282	C382	06	1141.15	1	158	147	248.50	25.50	274.00	2
30	82	182	1181	02	68.86	1	118	107	223.00	39.30	262.30	2
01	82	182	1181	22	2618.29	1	125	054	1143.00	14.50	1157.50	2
01	82	282	C282	22	510.89	1	C59	054	68.10	5.00	73.10	2
01	82	282	C282	23	433.72	1	C57	054	68.10	5.00	73.10	2
01	82	382	C482	03	2185.24	1	116	084	641.00	21.00	662.00	2
01	82	282	C382	23	905.70	1	081	071	235.50	16.70	252.20	2
01	82	382	C482	23	601.45	1	1C2	097	135.25	17.25	152.50	2
01	82	382	C682	22	132.20	1	C78	074	89.00	11.75	1CC.75	2
C1	82	382	C682	23	429.52	1	247	243	89.00	11.50	1CC.50	2
01	82	482	C782	04	250.65	1	14C	13C	6.50	14.00	2C.50	2
C1	82	482	0882	23	1729.44	1	165	134	734.75	16.45	751.20	2
02	82	282	0382	23	1038.77	1	213	199	325.20	22.80	348.00	2
03	82	182	1081	22	171C.84	1	191	186	60.50	56.50	117.00	2
C3	82	182	1081	02	133.34	1	149	138	249.00	27.50	276.5C	2
C3	82	282	C282	03	1284.00	1	158	154	76.50	27.50	1C4.00	2
03	82	282	C382	04	1722.22	1	141	135	63.00	73.25	136.25	2
C3	82	382	C482	23	676.62	1	140	066	770.82	85.75	856.57	2
03	82	382	C482	23	338.31	1	14C	066	0C00.00	000C.00	00CC.00	0
03	82	382	C582	23	1594.88	1	14C	066	770.83	85.75	856.58	2
03	82	382	C582	23	2223.19	1	140	066	0000.00	0000.00	00CC.00	0
03	82	382	0482	22	21.60	1	C87	062	7.00	19.00	26.00	2
03	82	382	C482	02	2836.38	1	282	265	28.50	10.00	38.50	2
03	82	382	0482	02	CCC0C.00	C	C0C	000	295.75	68.25	364.00	2
C3	82	382	C482	02	1183.36	1	277	267	206.50	36.50	243.00	2
03	82	382	C482	22	1626.72	1	266	260	97.00	38.50	135.50	2
03	82	382	C482	02	2708.15	1	137	134	42.00	26.50	68.50	2
C3	82	382	C582	23	4009.83	1	182	159	499.35	51.15	55C.5C	2
03	82	382	C682	23	4331.23	1	13C	112	401.30	34.20	435.50	2
03	82	382	C582	22	2884.41	1	259	207	1193.50	47.00	124C.5C	2
C3	82	382	C582	03	3545.75	1	172	159	204.25	108.25	312.50	2
03	82	382	C582	02	481.52	1	C79	068	236.50	36.00	272.50	2
03	82	382	0682	02	1850.84	1	137	12C	378.00	25.00	4C7.00	2
03	82	382	C682	02	2675.27	1	218	206	247.00	39.50	286.50	2
03	82	382	C682	17	1851.41	1	222	219	35.70	42.50	78.20	2
C3	82	482	C782	17	2006.61	1	192	188	58.70	44.30	1C3.00	2
03	82	382	C682	04	927.76	1	140	133	143.00	27.25	17C.25	2
03	82	482	0782	04	825.76	1	107	102	96.00	26.50	122.50	2
C3	82	382	C682	03	3268.15	1	137	118	423.00	37.00	46C.00	2
03	82	482	C782	22	889.16	1	112	107	443.30	75.00	518.30	2
03	82	482	C782	22	27.58	1	294	289	C000.00	000C.00	000C.00	0
C3	82	382	C682	02	1414.50	1	122	112	214.00	35.50	249.50	2
03	82	482	C782	22	2471.90	1	09C	081	158.00	5C.50	208.50	2
03	82	482	0782	03	1156.33	1	123	113	171.45	70.05	241.50	2
03	82	482	C782	03	289.09	1	115	105	CC00.00	0000.00	00CC.00	0
03	82	482	C782	03	2204.58	1	109	088	473.90	32.10	5C6.C0	2
03	82	482	C782	02	2776.00	1	243	234	161.25	55.75	217.00	2
03	82	482	C782	02	98.54	1	196	183	267.75	46.75	314.50	2
03	82	482	C782	03	1872.12	1	103	086	373.00	38.20	411.20	2
C3	82	482	C882	02	998.65	1	149	136	276.40	34.10	310.50	2
03	82	482	C882	04	3341.22	1	158	154	67.50	32.50	1CC.00	2
C3	82	482	C882	04	610.47	1	176	171	96.00	17.00	113.00	2
03	82	482	C882	03	1312.90	1	144	139	86.50	42.00	128.50	2
03	82	482	0982	22	859.43	1	173	154	375.50	80.25	455.75	2
C3	82	482	C982	22	35.96	1	228	209	0000.00	0000.00	000C.00	0
03	82	482	0982	03	1152.08	1	216	212	67.50	33.75	1C1.25	2
03	82	482	C982	22	545.33	1	223	216	143.25	23.25	166.50	2
03	82	482	C982	22	545.32	1	215	209	0000.00	0000.00	000C.00	0
03	82	482	0982	02	303.43	1	132	118	308.00	25.00	333.00	2
03	82	482	C982	22	1029.58	1	115	108	74.75	100.25	175.00	2
03	82	482	C982	23	145.02	1	110	107	44.75	29.55	74.30	2
03	82	382	C582	22	1682.56	1	170	160	194.50	35.50	23C.00	2
C3	82	482	C782	22	2144.72	1	119	102	226.50	37.25	263.75	2
05	82	282	C382	03	3152.71	1	141	105	816.50	56.50	873.00	2
C7	82	282	0382	05	240.78	1	107	102	20.00	98.00	118.00	2

07	82	282	0382	03	1613.68	1	085	074	226.75	41.65	268.40	2
07	82	282	0382	03	866.57	1	172	168	47.50	42.00	89.50	2
07	82	482	0782	24	2144.35	1	200	167	633.85	177.65	811.50	2
07	82	482	0782	24	857.74	1	213	180	0000.00	0000.00	0000.00	0
07	82	482	0782	24	1334.26	1	213	180	0000.00	0000.00	0000.00	0
07	82	482	0782	24	428.88	1	213	180	0000.00	0000.00	0000.00	0
07	82	482	0782	03	52.50	1	103	093	154.00	93.00	247.00	2
07	82	482	0782	03	52.50	1	103	093	0000.00	0000.00	0000.00	0
08	82	182	1081	03	248.88	1	185	181	33.50	73.50	107.00	2
08	82	182	1081	04	68.79	1	217	198	418.50	33.50	452.00	2
08	82	182	1081	04	258.77	1	217	198	0000.00	0000.00	0000.00	0
08	82	182	1181	03	810.50	1	153	133	412.50	67.25	479.75	2
08	82	182	1181	03	1621.00	1	153	133	0000.00	0000.00	0000.00	0
08	82	182	1181	03	810.50	1	153	133	0000.00	0000.00	0000.00	0
08	82	182	1081	22	2928.18	1	208	199	161.25	68.35	229.60	2
08	82	182	1181	04	104.00	1	358	321	199.90	100.85	300.75	2
08	82	182	1181	04	104.00	1	358	321	0000.00	0000.00	0000.00	0
08	82	182	1181	04	49.00	1	281	244	0000.00	0000.00	0000.00	0
08	82	182	1181	04	246.74	1	243	206	0000.00	0000.00	0000.00	0
08	82	182	1181	04	246.74	1	243	206	0000.00	0000.00	0000.00	0
08	82	182	1181	04	89.92	1	143	138	47.00	74.30	121.30	2
08	82	182	1181	03	202.24	1	143	134	209.00	21.25	230.25	2
08	82	182	1181	03	514.25	1	169	130	485.50	167.00	652.50	2
08	82	182	1181	03	70.12	1	169	130	0000.00	0000.00	0000.00	0
08	82	182	1181	04	93.04	1	191	186	47.00	75.20	122.20	2
08	82	182	1181	03	1646.10	1	243	231	260.00	33.00	293.00	2
08	82	182	1181	02	126.60	1	146	142	89.50	20.50	110.00	2
08	82	182	1281	03	262.00	1	080	072	101.00	38.90	139.90	2
08	82	182	1281	22	2656.42	1	146	134	235.50	66.50	302.00	2
08	82	182	1281	22	295.16	1	146	134	0000.00	0000.00	0000.00	0
08	82	182	1281	05	791.59	1	302	295	108.85	54.40	163.25	2
08	82	182	1281	05	1049.31	1	302	295	0000.00	0000.00	0000.00	0
08	82	182	1281	02	73.70	1	125	120	47.50	81.50	129.00	2
08	82	282	0182	03	346.00	1	133	127	91.25	63.50	154.75	2
08	82	282	0182	04	165.39	1	129	119	205.50	30.00	235.50	2
08	82	282	0182	04	17.40	1	129	119	0000.00	0000.00	0000.00	0
08	82	282	0282	04	141.32	1	146	139	48.30	119.50	167.80	2
08	82	282	0282	04	140.65	1	146	139	48.00	120.00	168.00	2
08	82	282	0282	03	147.86	1	088	078	169.75	65.85	235.60	2
08	82	282	0382	03	2766.64	1	210	194	303.30	90.70	394.00	2
08	82	282	0382	04	977.40	1	242	233	203.25	19.35	222.60	2
08	82	282	0382	03	71.22	1	183	178	75.00	39.50	114.50	2
08	82	282	0382	03	44.58	1	194	189	0000.00	0000.00	0000.00	0
08	82	282	0382	03	73.98	1	093	084	0000.00	0000.00	0000.00	0
08	82	282	0382	03	221.96	1	093	084	268.25	41.50	309.75	2
08	82	282	0382	04	120.82	1	074	070	35.00	80.00	115.00	2
08	82	282	0382	04	1457.61	1	122	111	161.25	99.25	260.50	2
08	82	282	0382	05	1167.73	1	122	111	161.25	98.25	259.50	2
08	82	282	0382	05	727.96	1	122	111	0000.00	0000.00	0000.00	0
08	82	282	0382	04	729.65	1	122	111	0000.00	0000.00	0000.00	0
08	82	282	0382	06	1803.06	1	130	125	71.10	43.70	114.80	2
08	82	382	0482	03	156.00	1	105	096	204.70	22.80	227.50	2
08	82	382	0482	04	69.00	1	063	061	40.00	22.00	62.00	2
08	82	382	0582	03	475.00	1	073	064	165.70	46.80	212.50	2
08	82	382	0582	03	58.44	1	063	057	132.00	15.30	147.30	2
08	82	282	0182	22	248.08	1	123	117	93.50	44.50	138.00	2
08	82	282	0282	03	279.50	1	181	167	306.00	34.00	340.00	2
08	82	482	0882	22	1902.98	1	072	067	97.50	63.50	161.00	2
08	82	182	1281	04	1075.77	1	316	309	108.85	54.40	163.25	2
08	82	182	1281	04	811.55	1	316	309	0000.00	0000.00	0000.00	0
08	82	382	0582	04	1006.95	1	224	211	298.00	24.75	322.75	2
08	82	382	0582	03	1198.94	1	211	202	165.00	53.50	218.50	2
08	82	382	0682	03	1198.94	1	193	185	141.00	47.00	188.00	2
08	82	382	0582	04	816.96	1	159	150	182.00	35.00	217.00	2
08	82	382	0582	04	816.96	1	159	150	0000.00	0000.00	0000.00	0
08	82	482	0882	03	1627.00	1	087	074	234.65	68.85	303.50	2
08	82	482	0882	03	915.38	1	087	074	0000.00	0000.00	0000.00	0
08	82	482	0782	22	422.92	1	102	091	224.25	44.75	269.00	2
08	82	482	0782	03	202.92	1	151	146	64.00	47.30	111.30	2
08	82	482	0882	04	2227.10	1	135	120	289.50	66.50	356.00	2
08	82	482	0882	22	294.21	1	118	105	261.30	60.45	321.75	2
08	82	482	0882	22	213.05	1	123	110	0000.00	0000.00	0000.00	0

08	82	482	0982	04	1302.73	1	059	049	227.30	17.50	244.80	2
08	82	482	0982	03	1473.95	1	059	051	153.80	36.50	190.30	2
08	82	482	0982	22	161.56	1	151	133	376.65	49.85	426.50	2
08	82	382	0682	04	2519.96	1	136	117	375.50	80.00	455.50	2
08	82	482	0782	03	247.22	1	120	111	145.00	72.50	217.50	2
11	82	282	0282	04	1451.43	1	175	139	700.20	148.60	848.80	2
11	82	282	0282	04	252.43	1	175	139	0000.00	0000.00	0000.00	0
11	82	282	0282	04	883.48	1	175	139	0000.00	0000.00	0000.00	0
11	82	282	0282	04	3723.23	1	175	139	0000.00	0000.00	0000.00	0
11	82	282	0382	02	3130.59	1	166	111	915.50	65.70	981.20	2
11	82	482	0982	03	66.78	1	255	169	2015.00	55.00	2070.00	2
11	82	482	0982	03	533.21	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	598.98	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	133.55	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	665.76	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	779.32	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	998.65	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	2797.61	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	2664.06	1	255	169	0000.00	0000.00	0000.00	0
11	82	482	0982	03	3063.72	1	255	169	0000.00	0000.00	0000.00	0
12	82	182	1081	03	1389.77	1	456	443	260.50	64.00	324.50	2
12	82	182	1081	03	305.07	1	456	443	0000.00	0000.00	0000.00	0
12	82	182	1181	03	2630.66	1	188	153	679.25	162.75	842.00	2
12	82	182	1181	03	2996.02	1	188	153	0000.00	0000.00	0000.00	0
12	82	182	1181	03	1680.70	1	188	153	0000.00	0000.00	0000.00	0
12	82	182	1181	03	55.20	1	294	259	0000.00	0000.00	0000.00	0
12	82	182	1181	03	62.86	1	294	259	0000.00	0000.00	0000.00	0
12	82	182	1181	03	35.26	1	294	259	0000.00	0000.00	0000.00	0
12	82	182	1181	04	1000.00	1	342	335	104.00	63.50	167.50	2
12	82	182	1181	04	1599.75	1	097	090	0000.00	0000.00	0000.00	0
12	82	182	1281	23	1074.35	1	117	111	84.00	77.50	161.50	2
12	82	282	0182	03	1557.11	1	108	069	623.20	74.75	697.95	2
12	82	282	0182	03	1167.82	1	108	069	0000.00	0000.00	0000.00	0
12	82	282	0182	03	111.22	1	108	069	0000.00	0000.00	0000.00	0
12	82	282	0182	03	111.22	1	108	069	0000.00	0000.00	0000.00	0
12	82	282	0182	03	1557.10	1	108	069	0000.00	0000.00	0000.00	0
12	82	282	0182	03	500.49	1	108	069	0000.00	0000.00	0000.00	0
12	82	282	0182	03	166.83	1	108	069	0000.00	0000.00	0000.00	0
12	82	282	0182	03	389.27	1	108	069	0000.00	0000.00	0000.00	0
12	82	282	0182	03	93.80	1	090	086	81.00	32.25	113.25	2
12	82	282	0282	05	1393.26	1	079	068	223.00	40.00	263.00	2
12	82	282	0282	12	2741.16	1	192	185	117.25	50.25	167.50	2
12	82	282	0282	03	1763.28	1	097	093	735.00	28.50	763.50	2
12	82	282	0382	04	704.83	1	106	092	288.20	59.80	348.00	2
12	82	282	0382	03	1758.50	1	141	135	114.80	42.20	157.00	2
12	82	282	0382	04	366.49	1	123	116	144.20	24.30	168.50	2
12	82	282	0382	03	1127.62	1	232	203	591.00	107.00	698.00	2
12	82	382	0582	03	1468.68	1	097	077	214.90	271.10	486.00	2
12	82	382	0682	04	1581.03	1	309	299	199.00	42.00	241.00	2
12	82	382	0682	04	1581.02	1	309	299	0000.00	0000.00	0000.00	0
12	82	482	0782	03	3920.48	1	230	205	561.60	45.10	606.70	2
12	82	482	0782	03	670.61	1	230	205	0000.00	0000.00	0000.00	0
12	82	482	0782	03	103.17	1	230	205	0000.00	0000.00	0000.00	0
12	82	482	0782	03	257.93	1	230	205	0000.00	0000.00	0000.00	0
12	82	482	0782	03	154.75	1	230	205	0000.00	0000.00	0000.00	0
12	82	482	0782	03	51.59	1	230	205	0000.00	0000.00	0000.00	0
12	82	482	0782	04	433.54	1	220	213	139.50	30.50	170.00	2
12	82	482	0882	03	3471.59	1	244	222	482.50	50.00	532.50	2
12	82	482	0882	03	394.18	1	209	201	121.90	71.10	193.00	2
12	82	482	0982	04	1609.37	1	229	216	151.00	163.50	314.50	2
12	82	482	0982	03	653.55	1	273	261	231.75	57.00	288.75	2
12	82	482	0982	04	465.37	1	153	143	158.95	85.05	244.00	2
12	82	482	0982	03	2916.13	1	236	191	980.20	101.80	1082.00	2
12	82	482	0782	12	436.80	1	284	268	190.50	61.40	251.90	2
12	82	482	0782	12	449.49	1	236	220	0000.00	0000.00	0000.00	0
13	82	182	1281	03	11.04	1	241	239	37.00	18.00	55.00	2
13	82	382	0582	03	39.50	1	127	123	18.50	13.00	31.50	2
13	82	382	0582	04	39.50	1	127	123	18.50	13.00	31.50	2
13	82	482	0782	03	914.07	1	125	108	293.45	123.10	416.55	2
13	82	482	0782	03	440.11	1	125	108	0000.00	0000.00	0000.00	0
13	82	482	0782	03	2031.27	1	125	108	0000.00	0000.00	0000.00	0
13	82	482	0782	03	2135.89	1	219	127	706.42	33.59	740.01	2

13	82	482	0882	03	251.28	1	219	127	706.42	33.58	740.00	2
13	82	482	0982	03	125.64	1	219	127	706.41	33.58	739.99	2
01	83	183	1082	03	760.77	1	151	147	78.80	18.70	97.50	2
01	83	183	1082	22	613.07	1	142	139	61.80	12.70	74.50	2
01	83	183	1082	02	1285.91	1	137	111	592.00	11.50	603.50	2
01	83	183	1082	23	475.08	1	241	237	90.75	17.50	108.25	2
01	83	183	1182	23	490.59	1	220	215	113.25	14.45	127.70	2
01	83	183	1182	22	632.17	1	165	162	71.80	12.70	84.50	2
01	83	183	1182	22	1277.13	1	157	153	88.80	8.50	97.30	2
01	93	183	1282	02	452.33	1	101	096	112.00	10.50	122.50	2
01	83	283	0183	22	517.98	1	077	070	163.00	12.00	175.00	2
01	83	283	0183	22	573.30	1	116	102	96.75	10.75	107.50	2
01	83	283	0183	22	346.00	1	114	112	16.80	35.20	52.00	2
02	83	183	1082	23	1857.99	1	159	108	1185.70	40.80	1226.50	2
02	83	183	1082	23	2477.05	1	159	108	0000.00	0000.00	0000.00	0
02	83	183	1082	23	61.93	1	159	108	0000.00	0000.00	0000.00	0
02	83	183	1082	23	247.71	1	159	108	0000.00	0000.00	0000.00	0
02	83	183	1082	23	1548.16	1	159	108	0000.00	0000.00	0000.00	0
02	83	283	0283	05	959.86	1	061	039	488.50	53.00	541.50	2
02	83	283	0283	05	472.76	1	061	039	0000.00	0000.00	0000.00	0
03	83	183	1082	23	4585.55	1	112	088	542.00	39.50	581.50	2
03	83	183	1082	24	915.63	1	125	066	1161.75	260.00	1421.75	2
03	83	183	1082	24	981.03	1	125	066	0000.00	0000.00	0000.00	0
03	83	183	1082	24	283.40	1	125	066	0000.00	0000.00	0000.00	0
03	83	183	1082	24	77.13	1	123	115	163.00	35.50	198.50	2
03	83	183	1082	03	523.46	1	154	137	331.30	79.20	410.50	2
03	83	183	1082	03	4595.01	1	121	093	618.70	58.60	677.30	2
03	83	183	1082	03	19.20	1	155	127	0000.00	0000.00	0000.00	0
03	83	183	1082	22	409.07	1	132	123	210.20	13.80	224.00	2
03	83	183	1282	02	501.40	1	109	099	209.00	37.25	246.25	2
03	83	183	1082	03	267.21	1	157	151	88.00	68.80	156.80	2
03	83	183	1082	03	131.61	1	157	151	0000.00	0000.00	0000.00	0
03	83	183	1082	02	133.70	1	133	116	388.15	32.85	421.00	2
03	83	183	1082	02	437.57	1	136	119	0000.00	0000.00	0000.00	0
03	83	183	1082	02	36.47	1	136	119	0000.00	0000.00	0000.00	0
03	83	•183	1082	22	262.44	1	177	161	360.00	28.50	388.50	2
03	83	183	1082	22	262.44	1	177	161	0000.00	0000.00	0000.00	0
03	83	183	1082	22	365.00	1	189	105	981.75	22.62	1004.37	2
03	83	183	1182	22	35.84	1	232	148	981.75	22.63	1004.38	2
03	83	183	1082	03	253.14	1	117	105	236.30	51.45	287.75	2
03	83	183	1192	02	57.68	1	166	154	227.75	57.75	285.50	2
03	83	183	1182	02	73.42	1	166	154	0000.00	0000.00	0000.00	0
03	83	183	1182	04	261.73	1	133	120	277.70	33.30	311.00	2
03	83	183	1182	04	29.08	1	133	120	0000.00	0000.00	0000.00	0
03	83	183	1182	03	212.20	1	132	119	338.00	29.20	367.20	2
03	83	183	1182	03	43.00	1	085	082	25.00	47.50	72.50	2
03	83	183	1282	24	1333.11	1	110	084	503.00	124.75	627.75	2
03	83	183	1282	24	376.01	1	110	084	0000.00	0000.00	0000.00	0
03	83	183	1282	17	263.36	1	067	064	39.00	34.70	73.70	2
03	83	183	1282	02	209.50	1	164	148	262.00	77.50	339.50	2
03	83	183	1282	02	292.41	1	096	090	71.50	73.25	144.75	2
03	83	183	1282	22	129.50	1	102	093	188.50	30.50	219.00	2
03	83	183	1282	03	728.80	1	151	135	330.65	42.10	372.75	2
03	83	183	1082	02	161.00	1	159	150	168.00	71.50	239.50	2
03	83	283	0183	03	101.00	1	080	070	201.25	31.75	233.00	2
03	83	283	0183	03	74.26	1	116	110	120.50	27.50	148.00	2
03	83	283	0183	23	121.50	1	119	112	103.00	67.50	170.50	2
03	83	283	0183	03	3019.16	1	117	104	278.35	32.40	310.75	2
03	83	283	0183	04	101.25	1	102	095	144.50	23.00	167.50	2
03	83	283	0183	22	104.02	1	100	095	67.00	56.50	123.50	2
03	83	283	0183	03	228.55	1	123	109	286.20	51.55	337.75	2
03	83	283	0183	03	228.54	1	123	109	0000.00	0000.00	0000.00	0
03	83	283	0183	03	257.11	1	123	109	0000.00	0000.00	0000.00	0
03	83	283	0283	02	151.02	1	091	077	237.00	101.00	338.00	2
03	83	283	0283	04	104.52	1	086	083	45.20	29.05	74.25	2
03	83	283	0283	03	1369.70	1	088	070	392.00	41.50	433.50	2
03	83	283	0283	02	1001.67	1	116	064	1158.40	91.60	1250.00	2
03	83	283	0283	02	214.64	1	116	064	0000.00	0000.00	0000.00	0
03	83	283	0283	02	214.64	1	116	064	0000.00	0000.00	0000.00	0
03	83	283	0183	03	745.35	1	156	118	702.50	218.00	920.50	2
03	83	283	0183	03	874.98	1	156	118	0000.00	0000.00	0000.00	0
03	83	283	0183	03	162.03	1	156	118	0000.00	0000.00	0000.00	0

03	83	283	0183	03	486.10	1	156	118	0000.00	0000.00	0000.00	0
03	83	283	0183	03	324.07	1	156	118	0000.00	0000.00	0000.00	0
03	83	283	0183	03	226.85	1	156	118	0000.00	0000.00	0000.00	0
03	83	283	0183	03	324.07	1	156	118	0000.00	0000.00	0000.00	0
03	83	283	0183	03	97.22	1	156	118	0000.00	0000.00	0000.00	0
05	83	183	1082	03	1291.45	1	203	141	1432.00	54.00	1486.00	2
05	83	183	1082	03	2582.91	1	203	141	0000.00	0000.00	0000.00	0
05	83	183	1082	03	1235.30	1	203	141	0000.00	0000.00	0000.00	0
05	83	183	1082	03	224.60	1	203	141	0000.00	0000.00	0000.00	0
05	83	183	1082	03	112.30	1	203	141	0000.00	0000.00	0000.00	0
05	83	183	1082	03	168.45	1	203	141	0000.00	0000.00	0000.00	0
07	83	183	1082	03	3817.50	1	196	153	936.70	88.20	1024.90	2
07	83	183	1082	03	1670.29	1	196	153	0000.00	0000.00	0000.00	0
07	83	183	1082	03	238.61	1	196	153	0000.00	0000.00	0000.00	0
07	83	183	1082	03	159.08	1	196	153	0000.00	0000.00	0000.00	0
07	83	183	1082	03	715.83	1	196	153	0000.00	0000.00	0000.00	0
07	83	183	1082	03	874.91	1	196	153	0000.00	0000.00	0000.00	0
07	83	183	1082	03	477.23	1	196	153	0000.00	0000.00	0000.00	0
08	83	183	1082	03	309.00	1	067	055	241.00	44.25	285.25	2
08	83	183	1082	03	296.45	1	130	128	37.40	6.60	44.00	2
08	83	183	1082	03	58.07	1	125	121	82.25	22.00	104.25	2
08	83	183	1082	04	141.89	1	121	118	49.50	33.75	83.25	2
08	83	183	1182	04	266.37	1	128	113	334.15	21.10	355.25	2
08	83	183	1182	04	217.30	1	128	113	0000.00	0000.00	0000.00	0
08	83	183	1182	04	217.30	1	128	113	0000.00	0000.00	0000.00	0
08	83	183	1182	03	200.03	1	180	171	156.10	54.10	210.20	2
08	63	183	1182	23	114.32	1	110	103	120.70	53.00	173.70	2
08	83	183	1282	03	72.62	1	107	103	58.25	51.05	109.30	2
08	83	183	1282	03	362.62	1	100	094	21.50	115.20	136.70	2
08	83	183	1282	03	86.00	1	106	103	50.70	24.30	75.00	2
08	83	183	1282	03	1208.90	1	159	136	452.80	99.20	552.00	2
08	83	183	1282	04	150.82	1	100	095	77.00	52.00	129.00	2
08	83	183	1282	03	194.46	1	099	089	193.25	42.00	235.25	2
08	83	183	1282	03	600.00	1	151	137	289.00	41.50	330.50	2
08	83	283	0183	02	825.13	1	134	119	289.00	84.80	373.80	2
08	83	183	1282	02	62.31	1	140	140	10.20	4.35	14.55	2
08	83	283	0183	03	128.60	1	114	110	45.80	46.00	91.80	2
08	83	283	0183	03	673.77	1	131	109	479.25	46.75	526.00	2
08	83	283	0183	03	350.99	1	134	130	183.40	21.60	205.00	2
09	83	183	1282	04	90.93	1	099	097	35.50	22.25	57.75	2
09	83	183	1282	13	2595.03	1	080	074	88.50	71.25	159.75	2
11	83	183	1182	03	165.74	1	243	175	1341.20	294.80	1636.00	2
11	83	183	1182	03	1602.15	1	243	175	0000.00	0000.00	0000.00	0
11	83	183	1182	03	765.74	1	243	175	0000.00	0000.00	0000.00	0
11	83	183	1182	03	3591.03	1	243	175	0000.00	0000.00	0000.00	0
11	83	183	1182	24	204.64	1	205	157	881.00	270.00	1151.00	2
11	83	183	1182	24	204.65	1	205	157	0000.00	0000.00	0000.00	0
11	83	183	1182	24	3683.60	1	205	157	0000.00	0000.00	0000.00	0
11	83	283	0283	02	3507.80	1	150	118	749.90	36.10	786.00	2
12	83	183	1082	01	561.06	1	208	192	282.00	105.50	387.50	2
12	83	183	1182	03	3604.45	1	174	119	1157.50	258.50	1416.00	2
12	83	283	0383	12	792.06	1	084	076	138.40	56.10	194.50	2
13	83	183	1182	02	2481.53	1	120	094	288.00	96.00	384.00	2
13	83	183	1182	02	620.38	1	120	094	0000.00	0000.00	0000.00	0
13	83	183	1282	22	1560.38	1	152	108	959.30	113.70	1073.00	2
13	83	183	1282	22	390.09	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	22	156.04	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	22	546.13	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	22	1872.45	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	22	468.11	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	22	312.08	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	22	1326.32	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	22	1170.28	1	152	108	0000.00	0000.00	0000.00	0
13	83	183	1282	03	252.81	1	089	083	89.15	51.10	140.25	2
13	83	183	1182	04	23.00	1	093	093	8.50	8.00	16.50	2
13	83	283	0183	04	2407.96	1	099	080	309.45	25.50	334.95	2
13	83	283	0183	04	1058.98	1	099	080	0000.00	0000.00	0000.00	0
13	83	283	0283	22	113.74	1	110	109	33.00	8.00	41.00	2
13	83	283	0283	04	113.74	1	110	109	33.00	8.00	41.00	2
13	83	283	0383	17	197.68	1	052	050	52.00	5.00	57.00	2
13	83	283	0283	03	4159.40	1	138	077	332.80	1146.20	1479.00	2
17	83	283	0183	22	1792.50	1	078	042	750.45	131.80	882.25	2

17	83	283	0183	22	320.09	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	448.12	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	768.21	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	128.03	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	896.24	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	128.03	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	576.16	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	320.10	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	896.24	1	078	042	0000.00	0000.00	0000.00	0
17	83	283	0183	22	128.03	1	078	042	0000.00	0000.00	0000.00	0
17	83	183	1082	22	1158.00	1	107	096	192.20	77.55	269.75	2
14	81	381	0481	05	363.42	1	171	161	176.00	40.00	216.00	2
14	81	381	0481	03	291.16	1	171	161	176.00	40.00	216.00	2
14	81	381	0681	04	385.44	1	103	095	174.50	26.30	200.80	2
14	82	182	1081	05	488.26	1	135	123	259.00	29.70	288.70	2
14	82	182	1081	03	489.98	1	135	122	257.00	31.70	288.70	2
14	82	182	1181	03	356.49	1	110	100	189.30	29.70	219.00	2
14	82	182	1181	23	415.72	1	110	100	189.30	29.70	219.00	2
14	82	182	1281	04	1339.00	1	120	106	292.00	43.50	335.50	2
14	82	182	1281	04	1849.09	1	120	106	0000.00	0000.00	0000.00	0
14	82	282	0282	03	687.36	1	090	074	308.55	83.40	391.95	2
14	82	282	0282	23	669.16	1	090	074	308.55	83.45	392.00	2
14	82	382	0482	05	449.50	1	134	125	196.00	31.50	227.50	2
14	82	182	1181	03	1735.28	1	158	155	0000.00	0000.00	0000.00	0
14	82	182	1181	03	201.78	1	158	155	0000.00	0000.00	0000.00	0
14	82	282	0382	03	587.23	1	143	069	0000.00	0000.00	0000.00	0
14	82	282	0382	03	2153.20	1	190	116	0000.00	0000.00	0000.00	0
14	82	282	0382	03	55.93	1	190	116	0000.00	0000.00	0000.00	0
14	82	182	1181	03	2.02	1	313	279	0000.00	0000.00	0000.00	0
14	82	282	0382	03	14.31	1	199	125	0000.00	0000.00	0000.00	0
14	82	282	0382	03	150.23	1	199	125	0000.00	0000.00	0000.00	0
14	82	282	0382	03	550.86	1	199	125	0000.00	0000.00	0000.00	0
14	82	182	1181	03	17.40	1	313	279	0000.00	0000.00	0000.00	0
14	82	182	1181	03	80.71	1	158	124	0000.00	0000.00	0000.00	0
14	82	382	0582	03	2171.00	1	106	106	0000.00	0000.00	0000.00	0
14	82	482	0982	02	1376.90	1	071	049	483.25	46.25	529.50	2
14	82	182	1281	04	162.86	1	364	350	0000.00	0000.00	0000.00	0
14	82	182	1281	04	117.93	1	364	350	0000.00	0000.00	0000.00	0
14	82	182	1181	03	57.86	1	402	368	0000.00	0000.00	0000.00	0
14	82	182	1181	03	3.50	1	402	368	0000.00	0000.00	0000.00	0
14	82	182	1181	03	6.73	1	402	368	0000.00	0000.00	0000.00	0
14	82	282	0382	03	9.53	1	387	313	0000.00	0000.00	0000.00	0
14	82	282	0382	03	0000.91	1	387	313	0000.00	0000.00	0000.00	0
14	82	282	0382	03	34.96	1	387	313	0000.00	0000.00	0000.00	0
14	82	382	0682	04	658.48	1	353	309	0000.00	0000.00	0000.00	0
14	82	382	0682	04	397.84	1	357	313	0000.00	0000.00	0000.00	0
14	82	382	0682	04	1340.97	1	357	313	0000.00	0000.00	0000.00	0
14	82	482	0982	01	755.65	1	282	237	954.50	62.00	1016.50	2
14	82	482	0982	01	1673.17	1	282	237	0000.00	0000.00	0000.00	0
14	82	382	0582	04	9.43	1	367	358	0000.00	0000.00	0000.00	0
14	82	382	0582	04	9.43	1	367	358	0000.00	0000.00	0000.00	0
14	82	482	0882	06	161.14	1	281	267	254.05	81.95	336.00	2
14	82	482	0882	06	161.14	1	281	267	0000.00	0000.00	0000.00	0
14	82	482	0882	06	161.13	1	281	267	0000.00	0000.00	0000.00	0
14	82	482	0882	06	161.14	1	281	267	0000.00	0000.00	0000.00	0
14	82	482	0882	06	161.14	1	281	267	0000.00	0000.00	0000.00	0
14	82	482	0882	06	161.14	1	281	267	0000.00	0000.00	0000.00	0
14	82	482	0982	06	161.14	1	281	267	0000.00	0000.00	0000.00	0
14	82	482	0882	06	161.14	1	281	267	0000.00	0000.00	0000.00	0
14	82	282	0382	04	477.96	1	476	413	1463.95	44.95	1508.90	2
14	82	282	0382	04	2987.26	1	476	413	0000.00	0000.00	0000.00	0
14	82	282	0382	04	955.92	1	476	413	0000.00	0000.00	0000.00	0
14	82	282	0382	04	955.92	1	476	413	0000.00	0000.00	0000.00	0
14	82	282	0382	04	298.73	1	476	413	0000.00	0000.00	0000.00	0
14	82	282	0382	04	298.73	1	476	413	0000.00	0000.00	0000.00	0
14	82	482	0782	03	847.29	1	340	328	263.00	30.50	293.50	2
14	82	482	0782	03	55.15	1	340	328	0000.00	0000.00	0000.00	0
14	82	482	0782	03	27.58	1	340	328	0000.00	0000.00	0000.00	0
14	82	482	0782	03	106.56	1	340	328	0000.00	0000.00	0000.00	0
14	82	182	1181	03	0000.00	0	000	000	709.00	56.90	765.90	2
14	82	282	0382	03	0000.00	0	000	000	1724.70	51.05	1775.75	2

32	81	281	0381	04	65.30	1	204	201	42.00	44.50	86.50	2
32	81	381	0581	04	39.36	1	129	126	79.00	4.50	83.50	2
32	81	381	0681	23	950.70	1	415	415	0000.00	0000.00	0000.00	0
32	82	182	1081	24	53.35	1	181	179	42.25	15.75	58.00	2
32	82	182	1081	24	243.80	1	139	134	102.00	29.00	131.00	2
32	82	182	1181	24	233.60	1	141	138	29.25	43.00	72.25	2
32	82	282	0282	24	27.70	1	181	178	51.75	40.75	92.50	2
33	81	481	0981	23	159.19	1	146	138	155.50	49.60	205.10	2
33	81	381	0681	04	273.47	1	113	107	145.70	7.30	153.00	2
33	81	181	1080	04	29.04	1	223	222	22.55	4.70	27.25	2
33	81	181	1080	04	21.66	1	203	201	47.50	6.35	53.85	2
33	81	181	1080	04	29.04	1	223	222	22.55	8.70	31.25	2
33	81	181	1280	03	90.97	1	145	139	120.00	35.70	155.70	2
33	81	181	1180	03	4.91	1	203	202	0000.00	0000.00	0000.00	0
33	81	281	0381	04	26.40	1	099	098	31.00	5.50	36.50	2
33	81	281	0181	03	6.79	1	158	140	0000.00	0000.00	0000.00	0
33	81	181	1180	04	30.60	1	213	171	0000.00	0000.00	0000.00	0
33	81	281	0181	04	35.01	1	160	140	0000.00	0000.00	0000.00	0
33	81	181	1280	03	6.68	1	186	186	0000.00	0000.00	0000.00	0
33	81	281	0281	02	69.00	1	116	102	0000.00	0000.00	0000.00	0
33	81	181	1280	04	25.88	1	194	194	0000.00	0000.00	0000.00	0
33	81	281	0181	04	92.92	1	157	117	0000.00	0000.00	0000.00	0
33	81	281	0281	06	145.84	1	109	105	89.25	13.50	102.75	2
33	81	181	1280	03	113.47	1	194	190	93.65	12.55	106.20	2
33	81	181	1280	23	40.56	1	262	261	5.00	17.40	22.40	2
33	81	181	1280	03	155.40	1	263	259	92.80	11.70	104.50	2
33	81	281	0181	03	172.62	1	254	248	146.00	9.60	155.60	2
33	81	381	0581	03	103.84	1	122	117	119.45	11.45	130.90	2
33	81	381	0681	03	551.61	1	113	078	212.85	205.75	418.60	2
33	81	281	0381	04	29.88	1	181	160	0000.00	0000.00	0000.00	0
33	81	381	0481	03	6.64	1	140	140	0000.00	0000.00	0000.00	0
33	81	381	0481	04	4.36	1	150	150	0000.00	0000.00	0000.00	0
33	81	481	0781	04	38.75	1	247	232	0000.00	0000.00	0000.00	0
33	81	381	0481	02	100.50	1	162	140	0000.00	0000.00	0000.00	0
33	81	381	0581	02	103.80	1	134	104	0000.00	0000.00	0000.00	0
33	81	381	0681	02	114.79	1	101	080	0000.00	0000.00	0000.00	0
33	81	481	0781	02	102.31	1	079	051	0000.00	0000.00	0000.00	0
33	81	281	0281	23	418.65	1	224	208	132.70	23.10	155.80	2
33	81	281	0381	03	25.88	1	218	176	0000.00	0000.00	0000.00	0
33	81	381	0481	04	8.12	1	175	148	0000.00	0000.00	0000.00	0
33	81	381	0481	04	191.04	1	172	169	43.00	25.00	68.00	2
33	81	181	1280	23	3.73	1	274	274	0000.00	0000.00	0000.00	0
33	81	281	0181	23	15.72	1	238	238	0000.00	0000.00	0000.00	0
33	81	181	1280	04	7.20	1	286	274	0000.00	0000.00	0000.00	0
33	81	281	0181	04	8.21	1	239	237	0000.00	0000.00	0000.00	0
33	81	281	0181	03	13.46	1	245	239	0000.00	0000.00	0000.00	0
33	81	181	1180	04	4.05	1	310	310	0000.00	0000.00	0000.00	0
33	81	281	0381	04	19.30	1	180	178	51.00	6.00	57.00	2
33	81	381	0581	02	169.54	1	122	115	158.60	10.75	169.35	2
33	81	381	0581	04	608.14	1	133	104	254.55	199.80	454.35	2
33	81	281	0381	04	80.72	1	195	195	0000.00	0000.00	0000.00	0
33	81	281	0381	03	81.64	1	205	205	0000.00	0000.00	0000.00	0
33	81	281	0281	06	98.76	1	224	223	0000.00	0000.00	0000.00	0
33	81	281	0381	02	85.96	1	210	182	0000.00	0000.00	0000.00	0
33	81	481	0881	02	99.27	1	069	063	0000.00	0000.00	0000.00	0
33	81	481	0781	03	29.85	1	076	074	0000.00	0000.00	0000.00	0
33	81	481	0881	24	10.47	1	052	049	0000.00	0000.00	0000.00	0
33	81	481	0781	23	1377.67	1	126	042	2011.00	16.00	2027.00	2
33	81	481	0881	04	165.29	1	063	060	72.30	14.45	86.75	2
33	81	381	0681	02	48.05	1	274	274	0000.00	0000.00	0000.00	0
33	81	481	0781	02	49.09	1	272	272	0000.00	0000.00	0000.00	0
33	81	281	0281	06	231.87	1	203	199	0000.00	0000.00	0000.00	0
33	81	481	0981	24	5.27	1	167	167	0000.00	0000.00	0000.00	0
33	81	181	1080	06	31.08	1	223	219	79.40	23.80	103.20	2
33	81	181	1080	06	90.72	1	210	209	19.80	12.70	32.50	2
33	81	181	1080	03	91.92	1	218	202	109.00	17.00	126.00	2
33	81	181	1080	04	91.92	1	218	202	109.00	16.75	125.75	2
33	81	181	1180	02	143.50	1	199	185	0000.00	0000.00	0000.00	0
33	81	181	1280	02	174.56	1	174	145	0000.00	0000.00	0000.00	0
33	81	181	1180	23	231.36	1	218	183	833.50	18.00	851.50	2
33	81	281	0281	03	150.40	1	139	122	0000.00	0000.00	0000.00	0
33	81	281	0381	03	38.72	1	095	094	26.00	5.70	35.70	2

33	81	381	0481	03	58.09	1	063	050	0000.00	0000.00	0000.00	0
33	81	281	0281	02	91.84	1	139	122	0000.00	0000.00	0000.00	0
33	81	181	1180	04	8.10	1	237	173	0000.00	0000.00	0000.00	0
33	81	281	0181	04	4.05	1	143	143	0000.00	0000.00	0000.00	0
33	81	181	1080	04	195.58	1	326	317	210.50	19.60	230.10	2
33	81	281	0281	06	60.51	1	221	220	24.95	8.30	33.25	2
33	81	381	0581	04	5.40	1	117	117	0000.00	0000.00	0000.00	0
33	81	481	0781	04	10.00	1	083	052	0000.00	0000.00	0000.00	0
33	81	281	0381	03	57.71	1	203	202	21.20	11.05	32.25	2
33	81	281	0381	04	123.46	1	190	188	40.50	11.00	51.50	2
33	81	381	0481	04	46.49	1	158	151	0000.00	0000.00	0000.00	0
33	81	281	0181	03	23.36	1	240	240	0000.00	0000.00	0000.00	0
33	81	281	0181	02	16.28	1	240	240	0000.00	0000.00	0000.00	0
33	81	481	0781	03	9.39	1	095	081	0000.00	0000.00	0000.00	0
33	81	481	0881	03	94.42	1	050	046	0000.00	0000.00	0000.00	0
33	81	481	0881	03	59.60	1	036	035	26.70	5.85	32.55	2
33	81	381	0681	04	378.52	1	113	095	0000.00	0000.00	0000.00	0
33	81	481	0781	04	935.81	1	092	046	182.90	163.50	346.40	2
33	81	481	0781	03	15.01	1	105	085	0000.00	0000.00	0000.00	0
33	81	481	0881	23	146.77	1	040	033	159.25	9.25	168.50	2
33	81	481	0881	03	12.78	1	164	164	0000.00	0000.00	0000.00	0
33	81	481	0781	03	2.96	1	195	195	0000.00	0000.00	0000.00	0
33	81	481	0981	02	262.65	1	156	143	207.90	17.15	225.05	2
33	81	481	0981	03	146.24	1	136	120	93.55	17.85	111.40	2
33	81	381	0481	04	6.33	1	287	280	0000.00	0000.00	0000.00	0
33	81	481	0881	04	157.91	1	156	146	235.30	9.45	244.75	2
33	81	481	0981	04	65.00	1	149	146	84.80	4.95	89.75	2
33	81	481	0981	04	620.82	1	143	111	632.95	19.70	652.65	2
33	81	481	0981	23	42.45	1	137	133	90.50	8.70	99.20	2
33	81	481	0981	06	83.48	1	120	119	29.30	6.00	35.30	2
33	81	381	0581	03	118.26	1	343	341	0000.00	0000.00	0000.00	0
33	81	181	1180	02	143.50	1	199	185	0000.00	0000.00	0000.00	0
33	81	181	1280	02	174.56	1	174	145	0000.00	0000.00	0000.00	0
33	81	281	0281	04	10.82	1	126	121	0000.00	0000.00	0000.00	0
33	81	281	0281	03	352.80	1	237	220	0000.00	0000.00	0000.00	0
33	81	381	0481	03	232.37	1	161	148	0000.00	0000.00	0000.00	0
33	81	281	0281	02	361.96	1	237	220	0000.00	0000.00	0000.00	0
33	81	381	0481	04	263.43	1	158	151	0000.00	0000.00	0000.00	0
33	81	181	1180	04	8.10	1	327	323	0000.00	0000.00	0000.00	0
33	81	381	0481	04	75.31	1	175	170	122.50	11.50	134.00	2
33	81	281	0381	02	236.71	1	194	189	116.80	10.45	127.25	2
33	81	381	0681	04	106.76	1	113	095	0000.00	0000.00	0000.00	0
33	81	281	0381	02	115.69	1	308	303	0000.00	0000.00	0000.00	0
33	81	481	0981	03	100.14	1	129	128	26.50	11.00	37.50	2
33	81	381	0481	04	35.90	1	287	280	0000.00	0000.00	0000.00	0
33	81	381	0481	03	51.11	1	290	277	0000.00	0000.00	0000.00	0
33	81	381	0481	04	60.30	1	384	377	0000.00	0000.00	0000.00	0
33	81	481	0981	03	117.06	1	534	533	0000.00	0000.00	0000.00	0
33	81	281	0281	02	0000.00	0	000	000	396.30	19.00	415.30	2
33	81	181	1180	02	0000.00	0	000	000	326.75	19.75	346.50	2
33	81	381	0681	04	0000.00	0	000	000	262.10	47.85	309.95	2
33	81	381	0481	04	0000.00	0	000	000	152.25	27.45	179.70	2
33	81	181	1280	02	0000.00	0	000	000	499.50	19.75	519.25	2
33	81	281	0281	03	0000.00	0	000	000	389.00	26.60	415.60	2
33	81	381	0481	03	0000.00	0	000	000	300.70	14.90	315.60	2
33	81	381	0481	04	10.64	1	448	441	0000.00	0000.00	0000.00	0
33	81	381	0581	04	124.93	1	419	419	0000.00	0000.00	0000.00	0
33	81	481	0881	03	141.63	1	164	160	0000.00	0000.00	0000.00	0
33	81	481	0881	03	0000.00	0	000	000	95.80	14.45	110.25	2
33	82	182	1081	06	61.00	1	178	173	0000.00	0000.00	0000.00	0
33	82	182	1081	06	61.00	1	178	173	0000.00	0000.00	0000.00	0
33	82	182	1081	06	32.14	1	104	100	0000.00	0000.00	0000.00	0
33	82	182	1081	06	16.08	1	104	100	0000.00	0000.00	0000.00	0
33	82	182	1081	06	121.99	1	116	111	0000.00	0000.00	0000.00	0
33	82	182	1081	06	16.08	1	104	100	0000.00	0000.00	0000.00	0
33	82	282	0182	03	5.18	1	098	098	0000.00	0000.00	0000.00	0
33	82	282	0382	03	5.28	1	064	064	0000.00	0000.00	0000.00	0
33	82	182	1081	02	7.98	1	157	141	0000.00	0000.00	0000.00	0
33	82	182	1081	03	6.86	1	136	136	0000.00	0000.00	0000.00	0
33	82	182	1081	03	13.78	1	167	141	0000.00	0000.00	0000.00	0
33	82	182	1281	03	4.44	1	099	099	0000.00	0000.00	0000.00	0
33	82	282	0182	03	27.18	1	083	069	0000.00	0000.00	0000.00	0

33	82	282	0282	03	16.12	1	057	050	0000.00	0000.00	0000.00	0
33	82	382	0482	24	103.52	1	074	071	79.00	6.00	85.00	2
33	82	382	0582	24	291.05	1	063	047	172.50	19.50	192.00	2
33	82	382	0582	03	351.68	1	062	049	311.70	9.80	321.50	2
33	82	182	1281	02	67.85	1	267	265	45.30	9.80	55.10	2
33	82	182	1281	03	13.08	1	258	257	0000.00	0000.00	0000.00	0
33	82	382	0482	24	11.14	1	090	084	0000.00	0000.00	0000.00	0
33	82	382	0482	03	7.62	1	076	076	0000.00	0000.00	0000.00	0
33	82	182	1081	24	8.62	1	145	145	0000.00	0000.00	0000.00	0
33	82	182	1181	24	25.16	1	112	098	0000.00	0000.00	0000.00	0
33	82	182	1281	24	26.26	1	091	075	0000.00	0000.00	0000.00	0
33	82	282	0182	24	1436.90	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0282	24	1436.90	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0382	24	1436.91	1	136	027	0000.00	0000.00	0000.00	0
33	82	182	1081	04	516.96	1	141	122	450.35	9.95	460.30	2
33	82	182	1281	04	416.81	1	082	068	335.25	10.75	346.00	2
33	82	182	1181	04	741.68	1	119	087	0000.00	0000.00	0000.00	0
33	82	182	1081	02	70.20	1	145	122	0000.00	0000.00	0000.00	0
33	82	182	1181	04	33.32	1	119	087	0000.00	0000.00	0000.00	0
33	82	182	1181	03	83.54	1	108	090	0000.00	0000.00	0000.00	0
33	82	182	1281	03	20.00	1	065	063	0000.00	0000.00	0000.00	0
33	82	182	1081	03	5.37	1	155	155	0000.00	0000.00	0000.00	0
33	82	182	1081	02	11.64	1	160	159	0000.00	0000.00	0000.00	0
33	82	182	1181	02	755.89	1	149	125	484.70	16.05	500.75	2
33	82	282	0182	03	5.13	1	104	104	0000.00	0000.00	0000.00	0
33	82	282	0282	04	8.04	1	092	092	0000.00	0000.00	0000.00	0
33	82	282	0282	03	11.40	1	090	086	0000.00	0000.00	0000.00	0
33	82	282	0282	04	7.87	1	069	069	0000.00	0000.00	0000.00	0
33	82	282	0182	24	206.07	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0282	24	206.07	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0382	24	206.08	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0182	03	5.49	1	098	098	0000.00	0000.00	0000.00	0
33	82	282	0282	03	91.83	1	084	068	0000.00	0000.00	0000.00	0
33	82	282	0382	02	459.67	1	073	036	404.25	20.25	424.50	2
33	82	282	0382	03	233.02	1	063	036	0000.00	0000.00	0000.00	0
33	82	382	0482	02	323.84	1	034	025	220.50	9.35	229.85	2
33	82	282	0282	03	91.83	1	084	068	0000.00	0000.00	0000.00	0
33	82	282	0382	03	243.37	1	063	036	0000.00	0000.00	0000.00	0
33	82	282	0182	04	77.89	1	115	111	0000.00	0000.00	0000.00	0
33	82	282	0182	03	58.54	1	103	056	5.80	13.95	19.75	2
33	82	282	0182	03	27.69	1	117	100	0000.00	0000.00	0000.00	0
33	82	282	0282	03	8.53	1	091	091	0000.00	0000.00	0000.00	0
33	82	282	0282	03	18.17	1	084	068	0000.00	0000.00	0000.00	0
33	82	282	0282	02	16.00	1	077	075	0000.00	0000.00	0000.00	0
33	82	282	0382	03	34.09	1	064	036	0000.00	0000.00	0000.00	0
33	82	282	0182	04	31.16	1	116	112	0000.00	0000.00	0000.00	0
33	82	282	0182	04	46.74	1	116	112	0000.00	0000.00	0000.00	0
33	82	182	1181	02	13.55	1	313	279	0000.00	0000.00	0000.00	0
33	82	182	1081	02	34.57	1	145	122	0000.00	0000.00	0000.00	0
33	82	182	1081	03	55.34	1	142	141	12.50	8.70	21.20	2
33	82	182	1081	03	379.79	1	175	152	139.50	31.90	171.40	2
33	82	182	1181	03	334.16	1	138	120	0000.00	0000.00	0000.00	0
33	82	282	0182	24	358.00	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0282	24	358.00	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0382	24	358.00	1	136	027	0000.00	0000.00	0000.00	0
33	82	282	0382	03	15.53	1	063	036	0000.00	0000.00	0000.00	0
33	82	382	0582	04	95.72	1	060	056	0000.00	0000.00	0000.00	0
33	82	382	0482	03	325.16	1	073	065	188.50	10.00	198.50	2
33	82	382	0582	04	59.83	1	060	056	0000.00	0000.00	0000.00	0
33	82	282	0382	06	183.86	1	243	233	181.00	43.30	224.30	2
33	82	282	0382	06	183.87	1	243	233	0000.00	0000.00	0000.00	0
33	82	282	0382	06	183.87	1	243	233	0000.00	0000.00	0000.00	0
33	82	282	0382	06	183.87	1	243	233	0000.00	0000.00	0000.00	0
33	82	282	0382	06	183.87	1	243	233	0000.00	0000.00	0000.00	0
33	82	282	0382	06	183.87	1	243	233	0000.00	0000.00	0000.00	0
33	82	182	1081	06	416.95	1	355	390	0000.00	0000.00	0000.00	0
33	82	182	1081	06	57.80	1	383	379	0000.00	0000.00	0000.00	0
33	82	382	0482	04	784.64	1	196	196	0000.00	0000.00	0000.00	0
33	82	182	1081	06	208.48	1	395	390	0000.00	0000.00	0000.00	0
33	82	182	1081	06	57.80	1	383	379	0000.00	0000.00	0000.00	0
33	82	182	1081	06	208.48	1	395	390	0000.00	0000.00	0000.00	0
33	82	182	1081	06	115.59	1	383	379	0000.00	0000.00	0000.00	0

33	82	182	1181	02	34.72	1	402	399	0000.00	0000.00	0000.00	0
33	82	182	1181	02	56.95	1	402	399	0000.00	0000.00	0000.00	0
33	82	182	1281	06	43.97	1	355	355	0000.00	0000.00	0000.00	0
33	82	382	0582	04	81.69	1	205	201	0000.00	0000.00	0000.00	0
33	82	182	1181	02	30.27	1	492	468	0000.00	0000.00	0000.00	0
33	82	282	0282	03	10.99	1	392	376	0000.00	0000.00	0000.00	0
33	82	282	0282	03	10.99	1	392	376	0000.00	0000.00	0000.00	0
33	82	282	0282	03	61.40	1	392	376	0000.00	0000.00	0000.00	0
33	82	182	1181	03	236.97	1	481	463	0000.00	0000.00	0000.00	0
33	82	182	1081	06	0000.00	0	000	000	113.95	16.35	130.30	2
33	82	182	1081	06	0000.00	0	000	000	97.00	7.00	104.00	2
33	82	282	0182	04	0000.00	0	000	000	91.75	69.00	160.75	2
37	82	182	1181	22	0000.00	0	000	000	64.00	19.50	83.50	2
33	82	282	0282	03	0000.00	0	000	000	223.25	21.95	245.20	2
33	82	182	1081	02	0000.00	0	000	000	138.65	32.30	170.95	2
33	82	282	0182	24	0000.00	0	000	000	870.50	5.00	875.50	2
33	82	282	0282	24	0000.00	0	000	000	870.50	5.00	875.50	2
33	82	282	0382	24	0000.00	0	000	000	870.50	5.00	875.50	2
33	82	182	1181	04	0000.00	0	000	000	680.70	21.30	702.00	2
37	82	182	1281	22	0000.00	0	000	000	42.85	34.40	77.25	2
33	82	182	1181	03	0000.00	0	000	000	145.90	33.20	179.10	2
33	82	282	0382	03	0000.00	0	000	000	517.00	15.50	532.50	2
33	82	282	0182	04	614.47	1	183	160	547.70	9.80	557.50	2
33	82	282	0282	04	537.64	1	157	137	482.25	9.05	491.30	2
33	82	282	0282	04	5.38	1	132	132	0000.00	0000.00	0000.00	0
33	82	282	0382	04	427.03	1	129	106	408.30	19.55	427.85	2
33	82	282	0282	03	10.64	1	149	144	0000.00	0000.00	0000.00	0
33	82	282	0282	03	2.69	1	144	144	0000.00	0000.00	0000.00	0
33	82	282	0182	04	56.22	1	162	160	0000.00	0000.00	0000.00	0
33	82	282	0382	04	53.28	1	114	110	91.50	8.45	99.95	2
33	82	382	0582	04	83.76	1	060	056	0000.00	0000.00	0000.00	0
33	82	382	0582	04	0000.00	0	000	000	68.45	41.05	109.50	2
34	82	382	0482	04	90.21	1	076	073	74.60	9.65	84.25	2
36	81	481	0981	03	29.28	1	141	139	0000.00	0000.00	0000.00	0
36	81	481	0981	03	31.47	1	141	139	0000.00	0000.00	0000.00	0
36	81	481	0881	03	38.48	1	042	037	122.00	8.00	130.00	2
36	81	281	0281	02	117.45	1	257	170	0000.00	0000.00	0000.00	0
36	81	281	0181	24	394.26	1	184	108	0000.00	0000.00	0000.00	0
36	81	281	0181	02	329.34	1	278	170	0000.00	0000.00	0000.00	0
36	81	281	0281	02	329.35	1	278	170	0000.00	0000.00	0000.00	0
36	81	381	0581	03	488.77	1	163	101	1431.70	64.30	1496.00	2
36	81	281	0181	24	117.77	1	184	108	0000.00	0000.00	0000.00	0
36	81	281	0181	02	62.74	1	278	170	1285.87	15.88	1301.75	2
36	81	281	0281	02	62.73	1	278	170	1285.88	15.87	1301.75	2
36	81	281	0181	24	0000.00	0	000	000	1790.50	40.10	1830.60	2
36	81	481	0981	03	0000.00	0	000	000	18.75	25.75	44.50	2
36	82	182	1081	03	35.30	1	102	086	369.00	37.00	406.00	2
36	82	182	1081	03	609.74	1	106	086	0000.00	0000.00	0000.00	0
36	82	182	1281	03	112.64	1	107	088	379.50	16.00	395.50	2
36	82	182	1181	03	86.83	1	176	153	167.25	102.25	269.50	2
36	82	182	1181	03	30.29	1	141	118	0000.00	0000.00	0000.00	0
36	82	182	1181	03	131.84	1	176	153	0000.00	0000.00	0000.00	0
36	82	382	0482	03	170.45	1	145	137	166.50	35.00	201.50	2
36	82	382	0482	03	83.95	1	098	090	0000.00	0000.00	0000.00	0
36	82	282	0382	03	323.45	1	066	039	0000.00	0000.00	0000.00	0
36	82	282	0382	03	26.33	1	067	040	0000.00	0000.00	0000.00	0
36	82	282	0182	03	267.14	1	219	214	0000.00	0000.00	0000.00	0
36	82	282	0282	03	878.59	1	213	190	0000.00	0000.00	0000.00	0
36	82	282	0382	03	26.33	1	066	039	0000.00	0000.00	0000.00	0
36	82	282	0282	03	51.82	1	401	378	0000.00	0000.00	0000.00	0
36	82	282	0282	03	207.25	1	401	378	0000.00	0000.00	0000.00	0
36	82	282	0282	03	0000.00	0	000	000	645.45	59.05	704.50	2
36	82	282	0382	03	0000.00	0	000	000	214.80	55.50	270.30	2
37	82	182	1081	22	265.25	1	146	142	89.20	16.05	105.25	2
37	82	182	1081	22	12.00	1	132	124	37.90	17.10	55.00	2
37	82	182	1181	22	42.42	1	183	162	0000.00	0000.00	0000.00	0
37	82	182	1281	22	116.66	1	154	140	0000.00	0000.00	0000.00	0
37	82	282	0182	22	115.54	1	112	105	0000.00	0000.00	0000.00	0
37	82	182	1181	22	127.27	1	183	162	0000.00	0000.00	0000.00	0
37	82	182	1281	22	213.81	1	155	131	0000.00	0000.00	0000.00	0
37	82	282	0182	22	191.31	1	115	100	0000.00	0000.00	0000.00	0
37	82	282	0282	22	108.21	1	094	077	12.95	13.00	25.95	2

37	82	282	C382	22	90.35	1	167	153	C000.00	0000.00	0000.00	0
37	82	382	C482	22	82.06	1	119	118	17.60	10.85	28.45	2
37	82	282	C382	22	163.45	1	167	153	C000.C0	0000.00	000C.00	0
37	82	382	C682	22	104.50	1	091	077	15.00	12.25	27.25	2
37	82	282	C382	22	CC0C.00	C	C0C	000	41.05	20.25	61.30	2
37	82	282	C182	22	0000.00	C	C00	00C	39.60	35.25	74.85	2
37	82	182	1081	22	4C.44	1	100	099	0000.00	0000.00	000C.00	0
37	82	182	1081	22	000C.00	C	CCC	00C	30.30	5.40	35.70	2
11	82	482	C982	03	732.54	1	322	236	0000.00	0000.00	00CC.00	0
11	82	482	0982	03	266.11	1	322	236	CC00.00	0000.00	00CC.00	0
03	81	381	0581	05	2991.99	1	783	769	123.50	40.75	164.25	2
08	82	382	C682	03	428.42	1	406	401	86.90	35.60	122.50	2
02	83	283	0383	22	274.48	1	149	101	1056.50	100.50	1157.00	2
02	83	283	C383	22	3934.12	1	149	1C1	0000.00	000C.00	00CC.00	0
C2	83	283	C383	22	1463.86	1	149	101	C000.00	0000.00	0000.00	0
02	83	283	0383	22	1097.89	1	149	1C1	C000.00	000C.00	C0CC.00	0
02	83	283	0383	22	274.48	1	149	101	0000.00	0000.00	00CC.00	0
02	83	283	0383	22	91.50	1	149	101	0C00.00	0000.00	0000.00	0
02	83	283	0383	22	640.43	1	149	101	0000.C0	0000.00	C0CC.00	0
C2	83	283	C383	22	640.43	1	149	101	C000.00	0000.0C	C0CC.00	0
02	83	283	C383	22	274.47	1	149	101	CC00.00	0000.00	00CC.00	0
C2	83	283	0383	22	457.46	1	149	1C1	0000.00	0000.00	C0CC.00	0
C1	83	283	C283	22	459.48	1	155	153	17.50	36.75	54.25	2
01	83	283	0383	22	931.20	1	133	124	138.30	74.20	212.50	2
03	82	482	C982	03	33.90	1	290	282	161.00	37.50	198.50	2
03	83	183	1082	03	155.94	1	275	247	C000.00	0000.00	000C.00	0
03	83	283	0183	22	1194.46	1	179	157	493.00	39.00	532.00	2
C3	83	183	1082	03	286.50	1	264	259	80.55	41.20	121.75	2
03	83	183	1282	04	20C.88	1	219	215	78.75	22.75	1C1.50	2
03	83	283	C183	24	235.75	1	194	148	963.50	143.75	11C7.25	2
03	83	283	C183	24	62.87	1	194	148	CC00.00	0000.00	000C.00	0
03	83	283	C183	24	15.71	1	194	148	0C00.00	000C.00	C0CC.00	0
C3	83	283	0283	22	597.81	1	171	104	785.05	18.70	803.75	2
03	83	283	C383	22	597.82	1	171	104	785.05	18.70	803.75	2
03	83	283	C283	22	1015.49	1	158	127	711.50	34.75	746.25	2
C1	83	283	C383	02	396.21	1	139	133	111.80	38.10	149.90	2
01	83	283	C383	02	198.11	1	139	133	CC00.C0	000C.0C	00CC.00	0
01	83	283	0383	02	198.11	1	139	133	0C00.00	0000.00	C0CC.00	0
01	83	283	C383	22	293.38	1	113	111	37.95	6.55	44.50	2
03	83	283	0283	04	343.08	1	194	177	337.00	73.00	41C.00	2
03	83	283	C183	03	226.29	1	176	171	66.00	55.00	121.00	2
03	83	283	C283	03	3C09.14	1	157	144	255.00	59.50	314.50	2
03	83	283	C383	03	2893.43	1	129	116	278.55	34.15	312.70	2
C3	83	283	C283	04	130.93	1	156	144	231.00	59.50	29C.50	2
03	83	283	0383	03	150.20	1	143	138	58.50	6C.50	119.00	2
03	83	283	0383	03	140.28	1	139	134	84.00	37.50	121.50	2
C3	83	283	0383	03	202.86	1	14C	127	256.00	54.00	31C.00	2
03	83	283	0383	02	322.18	1	128	116	236.70	49.30	286.00	2
C3	83	283	C383	03	751.98	1	132	119	275.00	5C.75	325.75	2
03	83	283	C283	02	462.84	1	172	161	72.00	97.00	169.00	2
03	83	283	0283	02	642.57	1	175	123	0C00.00	000C.0C	C0CC.00	0
03	83	283	0283	02	137.70	1	175	123	C000.00	0000.00	0000.00	0
03	83	283	0283	02	137.70	1	175	123	CC00.C0	000C.0C	00CC.00	0
03	83	283	C283	02	291.74	1	160	142	381.00	48.50	429.50	2
03	83	283	0383	17	109.42	1	154	145	160.60	55.40	216.00	2
03	83	283	0283	17	229.00	1	178	172	94.70	54.30	149.00	2
03	83	183	1282	22	138.34	1	232	223	183.25	36.75	220.00	2
09	83	283	0383	04	1C83.09	1	191	143	1C41.30	82.50	1123.80	2
C9	83	283	0383	04	1972.77	1	191	143	C00C.00	0000.00	C0CC.00	0
09	83	283	C383	04	812.31	1	191	143	C000.00	0000.00	00CC.00	0
03	83	283	C383	02	800.46	1	192	168	541.00	35.50	576.50	2
12	83	283	C383	05	653.50	1	189	178	209.55	63.65	273.20	2
12	83	283	C383	04	697.00	1	176	163	253.40	65.15	318.55	2
12	82	182	1181	04	182.27	1	166	159	0000.00	0000.00	00CC.00	0
31	81	481	C781	03	1728.85	1	C79	071	224.75	29.50	254.25	2
01	81	381	C581	22	72C.20	1	118	117	17.30	11.40	28.70	2
03	81	481	0781	23	179.48	1	C89	081	130.50	54.50	185.00	2
C3	81	481	C781	02	228.08	1	C91	081	134.00	98.25	232.25	2
01	81	381	C481	24	383.42	1	209	205	67.75	39.20	106.95	2
01	81	381	C581	24	318.16	1	197	195	39.80	26.45	66.25	2
01	81	381	C581	24	188.64	1	175	174	25.25	14.85	40.10	2
01	81	381	0681	24	234.48	1	167	165	49.75	16.00	65.75	2

31	81	381	0581	04	64.48	1	194	193	29.50	6.00	35.50	2
31	81	381	0681	04	178.66	1	167	163	92.50	6.50	99.00	2
31	81	481	0781	04	57.70	1	125	124	29.00	6.00	35.00	2
31	81	481	0881	04	131.22	1	091	088	79.50	6.00	85.50	2
31	81	481	0881	04	52.00	1	084	081	76.00	8.00	84.00	2
31	81	481	0981	04	34.40	1	075	074	30.50	8.00	38.50	2
31	81	481	0981	04	56.40	1	067	066	29.50	8.00	37.50	2
31	81	281	0381	04	102.00	1	279	278	24.00	11.50	35.50	2
31	81	381	0681	04	59.70	1	180	179	29.00	6.00	35.00	2
31	81	481	0881	04	181.60	1	131	123	108.50	12.00	120.50	2
31	81	481	0881	04	131.22	1	119	116	79.50	6.00	85.50	2
31	81	481	0981	04	34.40	1	103	102	30.50	8.00	38.50	2
31	81	481	0981	04	56.40	1	095	094	29.50	8.00	37.50	2
01	81	481	0981	23	119.92	1	219	211	150.50	34.25	184.75	2
01	81	481	0981	03	230.00	1	219	211	150.00	31.50	181.50	2
01	81	381	0581	23	1252.61	1	244	169	0000.00	0000.00	0000.00	0
01	81	481	0881	23	1503.13	1	266	175	0000.00	0000.00	0000.00	0
01	82	182	1181	23	1509.36	1	195	104	0000.00	0000.00	0000.00	0
01	81	381	0481	22	1000.48	1	259	244	371.00	4.10	375.10	2
01	81	381	0681	22	1420.41	1	181	155	687.30	10.20	697.50	2
01	81	481	0881	22	1425.07	1	135	104	734.00	17.25	751.25	2
31	82	182	1081	03	2186.35	1	072	064	169.70	23.30	193.00	2
31	81	381	0481	05	159.98	1	266	264	52.70	2.80	55.50	2
31	81	381	0481	05	68.56	1	266	264	0000.00	0000.00	0000.00	0
31	81	481	0981	03	627.00	1	111	110	29.80	9.40	39.20	2
31	82	182	1181	03	1206.13	1	051	046	115.50	15.70	131.20	2
31	82	182	1181	03	2196.35	1	046	040	118.75	28.20	146.95	2
31	81	481	0981	03	1028.78	1	102	086	354.90	35.10	390.00	2
31	81	481	0981	03	1678.53	1	102	086	0000.00	0000.00	0000.00	0
31	81	481	0781	03	1155.92	1	162	156	99.50	44.50	144.00	2
31	82	182	1081	03	2481.64	1	067	055	225.00	63.00	288.00	2
31	81	481	0981	03	2926.50	1	106	089	377.00	43.95	420.95	2
31	82	182	1181	03	2295.67	1	098	083	325.65	51.60	377.25	2
12	82	182	1181	04	3183.05	1	161	131	679.00	45.50	724.50	2
08	82	382	0582	22	180.02	1	125	115	199.00	41.00	240.00	2
31	82	282	0182	03	394.10	1	263	263	0000.00	0000.00	0000.00	0
31	82	282	0182	05	668.58	1	256	256	0000.00	0000.00	0000.00	0
01	82	382	0682	22	263.78	1	145	145	0000.00	0000.00	0000.00	0
13	83	183	1282	04	70.84	1	169	168	29.50	7.75	37.25	2
13	83	283	0383	04	22.00	1	071	069	51.50	5.50	57.00	2
12	81	381	0581	04	5388.54	1	247	154	985.95	118.05	1104.00	2
12	81	381	0681	04	5388.55	1	247	154	985.95	118.05	1104.00	2
08	81	381	0481	22	1748.11	1	244	218	119.40	90.10	209.50	2
08	81	381	0581	22	2224.73	1	208	196	192.50	109.30	301.80	2
08	82	282	0182	03	567.00	1	093	086	127.25	45.50	172.75	2
08	82	282	0182	03	347.50	1	080	077	56.75	24.75	81.50	2
12	82	482	0782	02	2762.15	1	253	243	768.00	144.00	912.00	2
12	82	482	0782	02	526.12	1	253	243	0000.00	0000.00	0000.00	0
01	83	183	1182	03	3620.23	1	157	145	253.30	44.70	298.00	2
01	83	183	1182	03	1271.97	1	157	145	0000.00	0000.00	0000.00	0
01	83	183	1182	03	125.76	1	191	179	0000.00	0000.00	0000.00	0
01	83	183	1182	03	357.92	1	191	179	0000.00	0000.00	0000.00	0
05	83	283	0183	03	2615.72	1	139	137	45.69	8.06	53.75	2
14	83	183	1282	23	1791.36	1	305	261	0000.00	0000.00	0000.00	0
14	83	283	0183	03	656.23	1	247	210	0000.00	0000.00	0000.00	0
14	83	183	1282	23	1595.93	1	305	261	0000.00	0000.00	0000.00	0
14	83	283	0183	03	908.63	1	247	210	0000.00	0000.00	0000.00	0
14	83	183	1282	23	626.98	1	305	261	0000.00	0000.00	0000.00	0
14	83	283	0183	03	555.27	1	247	210	0000.00	0000.00	0000.00	0
14	83	183	1282	23	24.43	1	305	261	0000.00	0000.00	0000.00	0
14	83	283	0183	03	252.40	1	247	210	0000.00	0000.00	0000.00	0
14	83	183	1282	23	325.70	1	305	261	0000.00	0000.00	0000.00	0
14	83	183	1282	23	244.28	1	305	261	0000.00	0000.00	0000.00	0
14	83	183	1282	23	488.55	1	305	261	0000.00	0000.00	0000.00	0
14	83	183	1282	23	708.40	1	305	261	0000.00	0000.00	0000.00	0
14	83	283	0183	03	302.88	1	247	210	0000.00	0000.00	0000.00	0
14	83	283	0183	03	1261.98	1	247	210	0000.00	0000.00	0000.00	0
14	83	283	0183	03	252.40	1	247	210	0000.00	0000.00	0000.00	0
14	83	283	0183	03	454.32	1	247	210	0000.00	0000.00	0000.00	0
14	83	283	0283	01	202.92	1	231	197	0000.00	0000.00	0000.00	0
14	83	283	0283	03	203.23	1	242	199	0000.00	0000.00	0000.00	0
14	82	182	1081	23	337.00	1	123	093	0000.00	0000.00	0000.00	0

14	82	282	0182	24	40.61	1	136	027	0000.00	0000.00	0000.00	0
14	82	282	0282	24	40.61	1	136	027	0000.00	0000.00	0000.00	0
14	82	282	0382	24	40.62	1	136	027	0000.00	0000.00	0000.00	0
14	83	183	1182	01	2162.29	1	312	275	0000.00	0000.00	0000.00	0
14	83	283	0283	01	177.56	1	205	172	0000.00	0000.00	0000.00	0
14	83	183	1182	01	381.58	1	312	275	0000.00	0000.00	0000.00	0
14	83	183	1282	03	148.80	1	288	243	0000.00	0000.00	0000.00	0
14	83	283	0283	03	392.62	1	217	174	0000.00	0000.00	0000.00	0
14	83	183	1182	03	43.67	1	312	271	0000.00	0000.00	0000.00	0
14	83	183	1282	03	348.76	1	288	243	0000.00	0000.00	0000.00	0
14	83	283	0283	01	760.94	1	206	172	0000.00	0000.00	0000.00	0
14	83	183	1182	03	21.83	1	312	271	0000.00	0000.00	0000.00	0
14	83	183	1282	03	97.66	1	288	243	0000.00	0000.00	0000.00	0
14	83	283	0283	01	226.29	1	206	172	0000.00	0000.00	0000.00	0
14	83	183	1182	03	65.49	1	312	271	0000.00	0000.00	0000.00	0
14	83	183	1282	03	23.25	1	288	243	0000.00	0000.00	0000.00	0
14	83	283	0283	01	913.14	1	206	172	0000.00	0000.00	0000.00	0
14	83	183	1282	03	1415.98	1	288	243	0000.00	0000.00	0000.00	0
14	83	183	1282	03	60.45	1	288	243	0000.00	0000.00	0000.00	0
14	83	183	1182	03	43.67	1	312	271	0000.00	0000.00	0000.00	0
14	83	283	0283	03	742.25	1	233	157	0000.00	0000.00	0000.00	0
14	83	283	0283	01	101.40	1	206	172	0000.00	0000.00	0000.00	0
14	82	382	0582	04	6.35	1	464	455	0000.00	0000.00	0000.00	0
14	83	283	0283	03	1247.13	1	216	174	0000.00	0000.00	0000.00	0
14	82	382	0582	04	9.53	1	464	455	0000.00	0000.00	0000.00	0
14	83	283	0283	03	120.99	1	216	174	0000.00	0000.00	0000.00	0
14	82	382	0582	04	9.53	1	457	448	0000.00	0000.00	0000.00	0
14	83	183	1082	22	283.15	1	332	293	0000.00	0000.00	0000.00	0
14	83	183	1082	22	424.73	1	332	293	0000.00	0000.00	0000.00	0
14	83	183	1082	22	84.94	1	332	293	0000.00	0000.00	0000.00	0
14	82	282	0382	04	10.63	1	547	484	0000.00	0000.00	0000.00	0
14	83	283	0283	03	346.43	1	208	165	0000.00	0000.00	0000.00	0
14	83	283	0383	03	285.32	1	169	129	0000.00	0000.00	0000.00	0
14	82	282	0382	04	3.32	1	547	484	0000.00	0000.00	0000.00	0
14	83	283	0383	03	95.11	1	169	129	0000.00	0000.00	0000.00	0
14	83	183	1082	22	2038.68	1	326	287	0000.00	0000.00	0000.00	0
14	82	282	0382	04	3.32	1	543	480	0000.00	0000.00	0000.00	0
14	83	283	0283	01	152.19	1	206	172	0000.00	0000.00	0000.00	0
14	83	183	1282	03	230.18	1	287	243	0000.00	0000.00	0000.00	0
14	83	283	0183	22	148.70	1	249	210	0000.00	0000.00	0000.00	0
14	83	283	0383	02	210.71	1	195	153	0000.00	0000.00	0000.00	0
14	82	382	0682	04	0000.00	0	000	000	933.15	98.60	1031.75	2
14	82	482	0982	03	0000.00	0	000	000	1049.75	80.25	1130.00	2
14	83	183	1082	02	0000.00	0	000	000	744.05	218.15	962.20	2
14	83	183	1282	23	0000.00	0	000	000	1010.00	64.75	1074.75	2
14	83	283	0383	02	0000.00	0	000	000	916.60	91.15	1007.75	2
14	83	283	0183	22	0000.00	0	000	000	873.60	62.40	936.00	2
14	83	283	0283	03	0000.00	0	000	000	877.50	155.50	1033.00	2
14	83	183	1182	01	0000.00	0	000	000	51.35	72.75	124.10	2
14	83	183	1082	22	0000.00	0	000	000	854.80	83.45	938.25	2
14	83	183	1282	03	0000.00	0	000	000	1014.50	66.00	1080.50	2
14	82	482	0982	03	0000.00	0	000	000	1290.10	415.90	1706.00	2
14	82	482	0982	03	0000.00	0	000	000	1047.70	33.30	1081.00	2
14	82	482	0882	22	2684.07	1	366	326	177.50	757.00	934.50	2
14	82	482	0882	02	2295.23	1	361	326	140.45	723.35	863.80	2
14	83	183	1082	03	1560.78	1	303	261	1005.25	17.00	1032.20	2
14	83	183	1282	03	1212.11	1	241	224	380.50	27.40	407.90	2
14	82	382	0582	04	9.43	1	428	419	0000.00	0000.00	0000.00	0
14	82	382	0482	23	799.24	1	482	437	0000.00	0000.00	0000.00	0
14	82	382	0482	23	1001.08	1	482	437	0000.00	0000.00	0000.00	0
14	82	382	0482	23	219.79	1	482	437	0000.00	0000.00	0000.00	0
14	82	382	0582	04	9.43	1	428	419	0000.00	0000.00	0000.00	0
14	82	482	0982	03	97.72	1	344	273	0000.00	0000.00	0000.00	0
14	83	183	1082	02	38.41	1	296	255	0000.00	0000.00	0000.00	0
14	82	382	0582	04	14.15	1	428	419	0000.00	0000.00	0000.00	0
14	82	482	0982	03	1759.03	1	344	273	0000.00	0000.00	0000.00	0
14	83	183	1082	02	1651.35	1	296	255	0000.00	0000.00	0000.00	0
14	82	382	0582	04	14.14	1	444	435	0000.00	0000.00	0000.00	0
14	82	482	0982	03	342.03	1	349	289	0000.00	0000.00	0000.00	0
14	83	183	1082	02	96.01	1	312	271	0000.00	0000.00	0000.00	0
14	82	382	0582	04	14.15	1	428	419	0000.00	0000.00	0000.00	0
14	82	482	0982	03	439.76	1	342	271	0000.00	0000.00	0000.00	0

14	83	183	1082	02	134.41	1	294	253	0000.00	0000.00	0000.00	0
14	82	382	0582	04	14.15	1	428	419	0000.00	0000.00	0000.00	0
14	82	482	0982	03	629.06	1	338	291	0000.00	0000.00	0000.00	0
14	82	482	0982	03	2681.77	1	354	307	0000.00	0000.00	0000.00	0
14	83	183	1182	03	1696.23	1	284	239	0000.00	0000.00	0000.00	0
14	83	183	1182	03	212.03	1	270	225	0000.00	0000.00	0000.00	0
14	82	482	0982	03	1563.58	1	346	275	0000.00	0000.00	0000.00	0
14	82	482	0982	03	650.15	1	345	300	0000.00	0000.00	0000.00	0
14	82	482	0982	03	439.76	1	346	275	0000.00	0000.00	0000.00	0
14	82	482	0982	03	1654.93	1	345	300	0000.00	0000.00	0000.00	0
14	82	482	0982	03	244.31	1	346	275	0000.00	0000.00	0000.00	0
14	83	183	1182	03	1625.55	1	270	225	0000.00	0000.00	0000.00	0
14	82	282	0382	04	10.63	1	527	464	0000.00	0000.00	0000.00	0
14	82	482	0882	03	906.29	1	401	313	0000.00	0000.00	0000.00	0
14	82	482	0982	03	906.29	1	401	313	0000.00	0000.00	0000.00	0
14	82	282	0382	04	10.63	1	543	480	0000.00	0000.00	0000.00	0
14	82	282	0382	04	5.31	1	537	474	0000.00	0000.00	0000.00	0
14	82	482	0982	03	60.98	1	366	321	0000.00	0000.00	0000.00	0
14	83	283	0283	03	2491.77	1	558	522	785.50	79.50	865.00	2
14	83	283	0283	17	2322.98	1	558	525	709.50	85.50	795.00	2
14	83	283	0283	03	119.72	1	558	522	0000.00	0000.00	0000.00	0
14	83	283	0283	17	124.89	1	558	525	0000.00	0000.00	0000.00	0
14	83	283	0283	03	125.28	1	558	522	0000.00	0000.00	0000.00	0
14	83	283	0283	17	49.96	1	558	525	0000.00	0000.00	0000.00	0
14	83	283	0283	03	47.33	1	558	522	0000.00	0000.00	0000.00	0
14	82	382	0582	04	6.35	1	451	442	0000.00	0000.00	0000.00	0
14	82	482	0982	03	20.62	1	366	328	0000.00	0000.00	0000.00	0
14	82	482	0982	03	52.50	1	366	328	0000.00	0000.00	0000.00	0
14	82	382	0582	04	6.35	1	451	442	0000.00	0000.00	0000.00	0
14	82	282	0382	04	33.22	1	543	480	0000.00	0000.00	0000.00	0
14	82	482	0882	03	906.29	1	401	313	0000.00	0000.00	0000.00	0
14	82	482	0982	03	906.29	1	401	313	0000.00	0000.00	0000.00	0
14	82	482	0882	03	75.53	1	401	313	0000.00	0000.00	0000.00	0
14	82	482	0982	03	75.53	1	401	313	0000.00	0000.00	0000.00	0
14	83	283	0283	04	251.54	1	544	536	88.50	98.40	186.90	2
14	82	382	0582	04	9.53	1	464	455	0000.00	0000.00	0000.00	0
14	83	183	1282	02	1121.36	1	269	255	712.00	80.00	792.00	2
14	83	283	0183	02	503.98	1	235	202	0000.00	0000.00	0000.00	0
14	83	283	0383	02	1769.91	1	178	138	0000.00	0000.00	0000.00	0
14	82	382	0582	04	6.35	1	464	455	0000.00	0000.00	0000.00	0
14	83	183	1282	02	129.39	1	269	255	283.50	53.50	337.00	2
14	83	283	0183	02	940.27	1	237	202	0000.00	0000.00	0000.00	0
14	83	283	0383	02	208.23	1	176	138	0000.00	0000.00	0000.00	0
14	82	382	0582	04	9.53	1	464	455	0000.00	0000.00	0000.00	0
14	83	183	1282	02	186.89	1	269	255	0000.00	0000.00	0000.00	0
14	83	283	0183	02	436.29	1	227	202	0000.00	0000.00	0000.00	0
14	83	283	0183	02	436.29	1	227	202	0000.00	0000.00	0000.00	0
14	83	283	0383	02	104.11	1	176	138	834.00	81.00	915.00	2
14	83	183	1182	03	1440.95	1	312	271	0000.00	0000.00	0000.00	0
14	83	283	0183	03	1384.68	1	247	211	809.00	55.50	864.50	2
14	83	283	0383	03	1759.45	1	178	138	0000.00	0000.00	0000.00	0
14	83	183	1182	03	218.32	1	312	271	0000.00	0000.00	0000.00	0
14	83	283	0183	03	558.00	1	247	211	0000.00	0000.00	0000.00	0
14	83	283	0383	03	237.76	1	178	138	0000.00	0000.00	0000.00	0
14	83	183	1182	03	349.33	1	312	271	0000.00	0000.00	0000.00	0
14	83	283	0183	03	124.00	1	247	211	0000.00	0000.00	0000.00	0
14	83	183	1082	04	61.08	1	341	328	0000.00	0000.00	0000.00	0
14	83	183	1082	04	366.47	1	341	328	0000.00	0000.00	0000.00	0
14	83	183	1082	04	244.32	1	341	328	0000.00	0000.00	0000.00	0
14	83	183	1082	04	549.71	1	341	328	234.50	77.50	312.00	2
14	83	283	0183	22	2736.03	1	249	210	0000.00	0000.00	0000.00	0
14	83	283	0183	02	2763.88	1	249	209	940.80	19.45	960.25	2
14	83	283	0383	02	2799.48	1	195	153	0000.00	0000.00	0000.00	0
14	83	283	0183	22	89.22	1	249	210	0000.00	0000.00	0000.00	0
14	83	283	0183	02	56.41	1	249	209	0000.00	0000.00	0000.00	0
14	83	183	1182	03	2713.46	1	309	274	754.00	91.50	845.50	2
14	83	283	0283	03	4206.05	1	248	172	0000.00	0000.00	0000.00	0
14	83	183	1182	03	441.73	1	309	274	0000.00	0000.00	0000.00	0
14	82	182	1081	06	43.20	1	160	135	281.50	101.65	383.15	2
14	82	182	1281	24	126.79	1	119	116	58.50	27.50	86.00	2
14	82	282	0282	04	385.44	1	051	041	235.55	14.95	250.50	2
14	83	183	0283	03	0000.00	0	000	000	1548.00	276.70	1824.70	2

```
14  82  382  C482  23   CCOC.00 C CCC OOC  1084.50    29.25  1113.75  2
14  83  283  C283  01   0000.00 C 00C 00C   783.30    58.00   841.30  2
14  82  482  C882  03   CCOC.00 C 000 00C  1053.65     7.35  1061.00  2
14  82  482  0982  03   C00C.00 C C00 00C  1053.65     7.35  1061.00  2
14  83  283  0183  03   000C.00 C 00C 000   841.75    45.00   886.75  2
14  83  183  1182  03   CCOC.00 C CCC 00C   994.00    87.00  1081.00  2
14  83  183  1182  03   000C.00 C 0CC 00C   930.10    53.85   983.95  2
14  82  382  C582  04   CC00.00 C 000 000    88.00    30.05   118.05  2
END INPUT CATA
COMMENT          CALCULATE SUMS BY YEAR
*SELECT IF       (YR EQ 81)
*SELECT IF       (DUMA EC 1)
FRECUENCIES      GENERAL = DIST CTR MONTH RANK
CPTIONS          3,8,9
STATISTICS       ALL
*SELECT IF       (YR EC 82)
*SELECT IF       (DUMA EQ 1)
FRECUENCIES      GENERAL = DIST CTR MONTH RANK
CPTIONS          3,8,9
STATISTICS       ALL
*SELECT IF       (YR EQ 83)
*SELECT IF       (DUMA EQ 1)
FRECUENCIES      GENERAL = DIST QTR MONTH RANK
CPTICNS          3,8,9
STATISTICS       ALL
*SELECT IF       (DUMA EQ 1)
FRECUENCIES      GENERAL = DIST YR CTR MONTH RANK
CPTICN           3,8,9
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (DUMB EC 2)
CONCESCRIPTIVE MHAW MHLT MHTCT
CPTICNS          1,4
STATISTICS       ALL
*SELECT IF       (YR EQ 82)
*SELECT IF       (DUMB EC 2)
CONDESCRIPTIVE MHAW MHLT MHTCT
CPTICNS          1,4
STATISTICS       ALL
*SELECT IF       (YR EQ 83)
*SELECT IF       (DUMB EC 2)
CONDESCRIPTIVE MHAW MHLT MHTCT
CPTICNS          1,4
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (DUMB EQ 2)
SCATTERGRAM      MHAW,MHLT WITH MHTCT
CPTIONS          1,7,8
STATISTICS       ALL
*SELECT IF       (YR EQ 82)
*SELECT IF       (DUMB EQ 2)
SCATTERGRAM      MHAW,MHLT WITH MHTCT
CPTICNS          1,7,8
STATISTICS       ALL
*SELECT IF       (YR EQ 83)
*SELECT IF       (DUMB EQ 2)
SCATTERGRAM      MHAW,MHLT WITH MHTCT
CPTICNS          1,7,8
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (DUMA EC 1)
CONCESCRIPTIVE AMTB BDBC BDCD
CPTICNS          1,4
STATISTICS       ALL
*SELECT IF       (YR EQ 82)
*SELECT IF       (DUMA EQ 1)
CONDESCRIPTIVE AMTB BDBC BDCD
CPTIONS          1,4
STATISTICS       ALL
*SELECT IF       (YR EQ 83)
*SELECT IF       (DUMA EQ 1)
CONDESCRIPTIVE AMTB BDBC BDCD
```

FILE: MASTER2 SPSS A NAVAL POSTGRADUATE SCHOOL

```
OPTIONS          1,4
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (DUMA EQ 1)
SCATTERGRAM      BDBD,BDCC WITH AMTB
OPTIONS          1,7,8
STATISTICS       ALL
*SELECT IF       (YR EQ 82)
*SELECT IF       (DUMA EQ 1)
SCATTERGRAM      BDBD,BDCC WITH AMTB
OPTIONS          1,7,8
STATISTICS       ALL
*SELECT IF       (YR EQ 83)
*SELECT IF       (DUMA EQ 1)
SCATTERGRAM      BDBD,BDCC WITH AMTB
OPTIONS          1,7,8
STATISTICS       ALL
*SELECT IF       (DUMB EQ 2)
CONDESCRIPTIVE   MHAW MHLT MHTOT
OPTIONS          1,4
STATISTICS       ALL
*SELECT IF       (DUMB EQ 2)
SCATTERGRAM      MHAW,MHLT WITH MHTOT
OPTIONS          1,7,8
STATISTICS       ALL
*SELECT IF       (DUMA EQ 1)
SCATTERGRAM      BDBD,BDCC WITH AMTB
OPTIONS          1,7,8
STATISTICS       ALL
*IF              (YR EQ 81) FLAG = 1
*IF              (YR EQ 82) FLAG = 1
*IF              (YR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*SELECT IF       (DUMA EQ 1)
BREAKDOWN        TABLES = AMTB BY QTR/AMTB BY YR/
                 BDBD BY QTR/BDBD BY YR/
                 BDCD BY QTR/BDCD BY YR/
                 BDBD BY DIST/BDCC BY DIST/
OPTIONS          1
STATISTICS       ALL
*IF              (YR EQ 81) FLAG = 1
*IF              (YR EQ 82) FLAG = 1
*IF              (YR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*SELECT IF       (DUMB EQ 2)
BREAKDOWN        TABLES = MHAW BY QTR/MHAW BY YR/MHAW BY YR BY DIST/
                 MHLT BY QTR/MHLT BY YR/MHLT BY YR BY DIST/
                 MHTOT BY QTR/MHTOT BY YR/MHTOT BY YR BY DIST/
                 MHAW BY QTR BY DIST/MHLT BY QTR BY DIST/
                 MHTOT BY QTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*IF              (YR EQ 81) FLAG = 1
*IF              (YR EQ 82) FLAG = 1
*IF              (YR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         PCTMHLT = (MHLT/MHTOT) * 100
BREAKDOWN        TABLES = PCTMHLT BY QTR/PCTMHLT BY YR/
                 PCTMHLT BY QTR BY DIST/
                 PCTMHLT BY DIST BY QTR/PCTMHLT BY RANK/
OPTIONS          1
STATISTICS       ALL
*IF              (YR EQ 81) FLAG = 1
*IF              (YR EQ 82) FLAG = 1
*IF              (YR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         PCTMHLT = (MHLT/MHTOT) * 100
SCATTERGRAM      PCTMHLT WITH MHTOT/PCTMHLT WITH DIST/
OPTIONS          1,7,8
STATISTICS       ALL
```

```
*IF             (YR EQ 81) FLAG = 1
*IF             (YR EQ 82) FLAG = 1
*IF             (YR EQ 83) FLAG = 1
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        MHEFF = (MHAW/MHTOT) * 100
SCATTERGRAM     MHEFF WITH MHTOT
OPTIONS         1,7,8
STATISTICS      ALL
*IF             (YR EQ 81) FLAG = 1
*IF             (YR EQ 82) FLAG = 1
*IF             (YR EQ 83) FLAG = 1
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        MHEFF = MHAW/MHTOT
BREAKDOWN       TABLES = MHEFF BY YR/MHEFF BY QTR/MHEFF BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 17)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*22100
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 18)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*25000
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 19)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*28600
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 22)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*24000
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 23)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*28000
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 24)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*33000
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 01)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*17400
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 81)
*SELECT IF      (RANK EQ 02)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*24000
BREAKDOWN       TABLES = LTTC BY QTR BY DIST/
```

```
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (RANK EQ 03)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*29300
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (RANK EQ 04)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*35600
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (RANK EQ 05)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*41300
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (RANK EQ 06)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*49800
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (RANK EQ 11)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*22800
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (RANK EQ 12)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*26951
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 81)
*SELECT IF       (RANK EQ 13)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*32200
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 82)
*SELECT IF       (RANK EQ 17)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*26600
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 82)
*SELECT IF       (RANK EQ 18)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*30100
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
*SELECT IF       (YR EQ 82)
*SELECT IF       (RANK EQ 19)
*SELECT IF       (DUMB EQ 2)
*COMPUTE         LTTC = (MHLT/1688)*34500
BREAKDOWN        TABLES = LTTC BY CTR BY DIST/
OPTIONS          1
STATISTICS       ALL
```

```
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 22)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*27700
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 23)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*32300
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 24)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*38100
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 01)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*20100
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 02)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*27700
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 03)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*33900
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 04)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*40600
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 05)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*47900
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 06)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*57700
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 11)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*23900
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 12)
```

```
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*28245
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 82)
*SELECT IF      (RANK EQ 13)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*33800
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 17)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*27800
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 18)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*31500
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 19)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*36100
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 22)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*29000
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 23)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*33800
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 24)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*40000
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 01)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*21100
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 02)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*29000
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 03)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*35600
```

```
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 04)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*42500
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 05)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*50300
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 06)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*60500
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 11)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*24600
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 12)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*29374
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*SELECT IF      (YR EQ 83)
*SELECT IF      (RANK EQ 13)
*SELECT IF      (DUMB EQ 2)
*COMPUTE        LTTC = (MHLT/1688)*34900
BREAKDOWN       TABLES = LTTC BY CTR BY DIST/
OPTIONS         1
STATISTICS      ALL
*IF             (QTR EQ 181) IRATE = .1314
*IF             (QTR EQ 281) IRATE = .1314
*IF             (QTR EQ 381) IRATE = .1764
*IF             (QTR EQ 481) IRATE = .1620
*IF             (QTR EQ 182) IRATE = .1835
*IF             (QTR EQ 282) IRATE = .1439
*IF             (QTR EQ 382) IRATE = .1322
*IF             (QTR EQ 482) IRATE = .1426
*IF             (QTR EQ 183) IRATE = .1200
*IF             (QTR EQ 283) IRATE = .1300
*IF             (YR EQ 81) FLAG = 1
*IF             (YR EQ 82) FLAG = 1
*IF             (YR EQ 83) FLAG = 1
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (DUMA EQ 1)
*COMPUTE        BLTC = (BDBD + 34)/(365)*AMTB*IRATE
BREAKDOWN       TABLES = BLTC BY CTR/BLTC BY DIST/BLTC BY QTR BY DIST/
OPTIONS         1
STATISTICS      ALL
FINISH
```

DEPARTMENT OF TRANSPORTATION U.S. COAST GUARD CG-3621 (Rev. 2-76)	BILLING FOR SALE OF MATERIALS OR SERVICES	BILL NO.
BILLING UNIT		DATE

(Coast Guard Units should use a window envelope when forwarding this form.)

TO:

FOR CG ACCOUNTING OFFICE USE ONLY

APPROPRIATION FUND OR RECEIPT SYMBOL NO.

A/R ACCOUNT NO.

The following materials or services were furnished to you by the U. S. Coast Guard:

DATE SERVICES RENDERED	DESCRIPTION	AMOUNT
	TOTAL	

Please mail check or money order payable to U. S. Coast Guard with a copy of this form to:

(Signature of Billing Officer)

☆GPO 716-565

S/N 0102-LF-013-2803

TRAVEL VOUCHER OR SUBVOUCHER (Complete by typewriter, ink, or ball point pen (PRESS HARD) do not use pencil)

READ PRIVACY ACT STATEMENT ON REVERSE PRIOR TO COMPLETING THIS FORM

LAST NAME FIRST NAME MIDDLE INITIAL (Print/Type) | GRADE/RANK | SSN

CHECK MAILING ADDRESS (Include ZIP Code) | DUTY PHONE NO

ORGANIZATION AND STATION

TRAVEL ORDERS (Paragraph, S.O. No., Issuing Hq, Date) (Include amending orders)

PRIOR TRAVEL PAYMENTS OR ADVANCES UNDER THESE ORDERS (Amount, DO Voucher No., Date Received, Place paid, or DO Station No. If none, so state)

10 FOR DO USE ONLY

DO VOUCHER NO

SUBVOUCHER NO

PAID BY

1 ITINERARY (See Item 25 for Symbols)					2	3. NUMBER OF MEALS		4
DATE 19__	LOCAL TIME (24 Hour Clock)	PLACE (Home, Office, Base, Activity, City and State; City and Country, etc.)	MODE OF TRAVEL	REASON FOR STOP	COST OF LODGING	GOVT / DED *	OPEN MESS	POC MILES
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							
	DEP							
	ARR							

COMPUTATIONS

5 REIMBURSABLE EXPENSES/CHARGE FOR DEDUCTIBLE MEALS * (See Item 24)

DATE	NATURE AND EXPLANATION	AMT CLAIMED	ALLOWED

6. Long distance telephone calls are certified as necessary in the interest of the Government. | APPROVING OFFICER (31 USC 680a)

7 TR'S/MTA'S/MT'S (If none, so state)

NUMBER	FROM	TO

SUMMARY OF PAYMENT

Per Diem	
Actual Expense	
Mileage or Transp Allowances	
Reimbursable Expenses	
Total Entitlement	
Less Previous Payments	
Less Voucher Deductions	
Amt Charged to Acctg Class	

11 PAYMENT DESIRED ☐ CHECK ☐ CASH

8. LEAVE STATEMENT ______ days ______ hours taken between ______ and ______

12. ☐ PER DIEM REQUESTED

9. POC TRAVEL ☐ OWNER/OPERATOR (See Item 22d) ☐ PASSENGER

13. BAS RATE

PENALTY: The penalty for willfully making a false claim is A MAXIMUM FINE OF $10,000 OR MAXIMUM IMPRISONMENT OF 5 YEARS, OR BOTH (U.S. Code, Title 18, Section 287.)

→ I hereby claim any amount due me. The statements on face, reverse, and attached are true and complete. Payment or credit has not been received. | 14 SIGNATURE OF CLAIMANT | DATE

15. ACCOUNTING CLASSIFICATION

16 COLLECTION DATA

17 COMPUTED BY	18 AUDITED BY	19 TVL RCRD POSTED BY	20 RECEIVED (Payee signature and date or check no.)	21 AMOUNT PAID
				→

DD FORM 1 JUN 78 1351—2 EDITION OF 1 JUL 65 WILL BE USED UNTIL EXHAUSTED. *Exception to SF 1012 and 1012a approved by NARS, GSA April 1978.*

APPENDIX B: EFFECTIVENESS DATA AND COMPUTER PROGRAM

```
FILE: DATAEFF  SPSS      APPENDIX B

FILE NAME        INSDAT1
VARIABLE LIST    TIMPD,DATSO,ITYPE,YRBLT,GRTON,VTYPE,ACTMH,
                 STDMH,ACTRK,NU835,MONTH,QTR,YEAR,NUISP,STDCL,INSCR
INPUT FORMAT     FIXED (F1.0,1X,F1.0,1X,F1.0,1X,F2.0,1X,F6.0,1X,F1.0,
                 1X,F6.2,
                 1X,F5.2,1X,F4.2,1X,F2.0,1X,F4.0,1X,F3.0,1X,F2.0,1X,
                 F1.0,1X,F2.0,1X,F4.2)
N OF CASES       244
INPUT MEDIUM     CARD
VAR LABELS       TIMPD, CATERGGY CF DATA CCLLECTION PERIOD/
                 DATSO, DATA SCURCE 3=NEW YORK 4=HONOLULU/
                 ITYPE, INSPECTION TYPE 1=FF 2=DD 3=FD/
                 YRBLT, YEAR VESSEL BUILT/
                 GRTON, GROSS TONNAGE OF VESSEL IN WHOLE INCREMENTS/
                 VTYPE, TYPE OF VESSEL 1=SUP 2=FRT 3=TNK 4=MODU 5=LNG/
                 ACTMH, ACTUAL MANHOURS TO PERFORM THE INSPECTION/
                 STDMH, STANDARD MANHOURS PROJECTED TO PERFORM INSP/
                 ACTRK, AVERAGE RANK OF INSPECTORS PER INSPECTION/
                 NU835, NUMBER OF 835S ISSUED/
                 MONTH, MONTH AND CALENDAR YEAR INSPECTION COMP/
                 QTR,   QUARTER AND FISCAL YEAR INSPECTION COMP/
                 YEAR,  FISCAL YEAR INSPECTION COMPLETED/
                 NUISP, NUMBER OF INSPECTORS PER INSPECTION/
                 STDCL, STANDARD CLASS OF VESSEL/
                 INSCR, NUMBER OF INSPECTORS SCORE/
READ INPUT DATA
1 3 1 76    297 1  55.00 16.00 3.00 01 1279 180 80 1 11  .00
1 3 1 73    292 1  68.50 16.00 3.00 24 0780 480 80 1 11  .00
1 3 1 45  14462 2 104.00 56.00 3.00 32 0480 380 80 1 21 -.20
1 3 1 70    247 1  51.50 10.00 3.00 07 0979 479 79 1 10  .00
1 3 1 77  21572 3  60.50 65.00 3.00 06 1279 180 80 1 35 -.20
1 3 1 45  15254 3  94.50 62.00 3.00 01 0980 480 80 4 33  .25
1 3 1 78  69472 3 156.50 74.00 3.05 16 1180 181 81 2 37  .00
1 3 1 72   5923 4  24.00 32.00 3.00 07 0580 380 80 1 40 -.05
1 3 1 74    186 1  72.00 16.00 3.30 05 0979 479 79 1 11  .00
1 3 1 44  15995 2  72.00 56.00 3.00 00 0180 280 80 1 21 -.20
1 3 1 45  17184 2  37.00 56.00 3.00 10 0380 280 80 4 21  .25
1 3 1 45  18024 2  23.00 32.00 3.00 05 0380 280 80 4 20  .25
1 3 1 45  13858 2  85.50 56.00 3.00 08 0980 480 80 1 21 -.20
1 3 1 76  21572 3  34.00 35.00 3.00 19 1080 181 81 1 34 -.20
1 3 1 73   7735 4  24.00 32.00 3.00 22 0480 380 80 1 40 -.05
1 3 1 77   7501 4  24.00 32.00 3.00 17 0879 479 79 1 40 -.05
1 3 1 44  18362 2  13.00 32.00 3.00 15 0180 280 80 1 20 -.20
1 3 1 73   5202 4  18.00 32.00 3.00 07 1080 181 81 1 40 -.05
2 3 1 73    199 1 101.00 16.00 3.00 00 0681 381 81 1 11  .00
2 3 1 74    197 1  35.00 16.00 3.00 01 0681 381 81 1 11  .00
2 3 1 74    298 1  45.50 16.00 3.00 02 0481 381 81 1 11  .00
2 3 1 76    291 1  62.00 10.00 3.00 00 0181 281 81 2 10  .15
2 3 1 70    247 1  14.00 16.00 3.00 07 0981 481 81 1 11  .00
2 3 1 78    299 1  35.00 16.00 3.00 04 1181 182 82 1 11  .00
2 3 1 72    196 1  46.50 16.00 3.00 11 0282 282 82 1 11  .00
2 3 1 79    282 1   5.50 10.00 3.00 20 0281 281 81 2 10  .15
2 3 1 74    281 1  17.00 10.00 3.20 20 0681 381 81 1 10  .00
2 3 1 76    198 1  37.00 16.00 3.00 06 0181 281 81 1 11  .00
2 3 1 44  13659 3 102.00 62.00 3.10 08 0581 381 81 1 33 -.20
2 3 1 78    197 1  58.00 16.00 3.00 13 0382 282 82 1 11  .00
2 3 1 75    197 1  23.50 10.00 3.10 00 0282 282 82 1 10  .00
2 3 1 78    299 1  44.00 10.00 3.00 16 1280 181 81 1 10  .00
2 3 1 45  18024 2  22.00 32.00 3.15 25 0282 282 82 2 20  .00
2 3 1 76  21572 3  81.50 35.00 3.00 00 0981 481 81 1 34 -.20
2 3 1 72  41127 2  44.00 64.00 3.05 05 1081 182 82 2 23  .00
2 3 1 74   7735 4  32.00 32.00 3.00 14 0482 382 82 1 40 -.05
2 3 1 77   7501 4  91.00 60.00 3.00 11 0381 281 81 1 41 -.05
2 3 1 44  18362 2  17.50 32.00 3.00 09 0181 281 81 2 20  .00
2 3 1 75   5022 4  25.00 32.00 3.00 00 0481 381 81 1 40 -.05
2 3 1 73    208 1   7.50 10.00 3.00 17 0381 281 81 1 10  .00
1 3 2 40   1167 3  44.50 62.00 2.90 05 0780 480 80 4 33  .25
1 3 2 54  15864 2  52.00 32.00 2.93 00 0780 480 80 3 20  .20
1 3 2 71  19127 2  28.00 32.00 2.75 06 0880 480 80 2 20  .00
1 3 2 69  19267 2  48.00 32.00 2.95 00 0780 480 80 2 20  .00
1 3 2 63  11105 2  85.00 56.00 2.95 00 0680 380 80 4 21  .25
1 3 2 68  19285 2  38.00 32.00 2.75 03 0780 480 80 2 20  .00
```

FILE: DATAEFF SPSS A NAVAL POSTGRADUATE SCHOOL

1	3	2	68	18876	2	73.50	32.00	2.83	04	0880	480	80	4	20	.25
1	3	2	73	21150	2	115.00	40.00	2.95	04	1180	181	81	4	22	.25
1	3	2	72	30990	2	71.00	40.00	2.85	02	0180	280	80	4	22	.25
1	3	2	44	10947	2	38.00	32.00	2.83	03	0180	280	80	3	20	.20
1	3	2	47	1488	3	49.00	34.00	2.88	05	0879	479	79	4	32	.25
1	3	2	68	10396	2	55.50	32.00	2.97	00	1080	181	81	3	20	.20
1	3	2	60	7848	2	52.00	32.00	2.80	10	0880	480	80	3	20	.20
1	3	2	42	1173	3	51.00	62.00	2.83	02	1180	181	81	3	33	.20
1	3	2	44	11601	2	47.50	32.00	2.90	05	1279	180	80	3	20	.20
1	3	2	57	1149	3	34.50	34.00	2.93	02	0380	280	80	3	32	.20
1	3	2	64	10484	2	104.00	32.00	2.83	06	0980	480	80	4	20	.25
1	3	2	61	9316	2	45.50	32.00	2.87	06	0280	280	80	3	20	.20
1	3	2	62	12724	2	54.00	32.00	2.88	12	0880	480	80	4	20	.25
1	3	2	62	12691	2	113.00	32.00	2.83	06	1080	181	81	4	20	.25
1	3	2	62	12691	2	48.00	32.00	2.87	04	0380	280	80	3	20	.20
1	3	2	69	20877	3	42.00	35.00	2.85	05	0480	380	80	2	34	.00
1	3	2	62	11164	2	68.00	32.00	2.88	11	1279	180	80	4	20	.25
1	3	2	74	32269	2	37.00	40.00	2.83	10	0880	480	80	3	22	.20
1	3	2	66	9323	2	58.00	32.00	2.82	03	1180	181	81	5	20	.10
1	3	2	66	9313	2	60.00	32.00	2.85	06	0880	480	80	6	20	-.05
1	3	2	69	9322	2	53.50	32.00	2.93	06	0879	479	79	3	20	.20
1	3	2	66	9313	2	66.00	32.00	2.93	03	0480	380	80	4	20	.25
1	3	2	78	17376	2	26.00	32.00	2.90	06	0680	380	80	4	20	.25
1	3	2	73	41127	2	75.00	40.00	2.88	02	1279	180	80	5	22	.10
2	3	2	67	24471	2	88.00	40.00	2.90	06	0182	282	82	4	22	.25
2	3	2	54	15827	2	94.00	32.00	2.98	02	0181	281	81	6	20	-.05
2	3	2	53	15827	2	62.00	32.00	2.90	02	0681	381	81	3	20	.20
2	3	2	64	11202	2	73.00	32.00	2.90	08	0381	281	81	4	20	.25
2	3	2	69	11757	2	25.00	32.00	2.97	03	0381	281	81	3	20	.20
2	3	2	79	30685	2	77.00	40.00	2.88	05	1281	182	82	4	22	.25
2	3	2	44	10947	2	56.00	32.00	2.83	05	0182	282	82	4	20	.25
2	3	2	70	15131	2	114.50	32.00	2.92	02	0282	282	82	5	20	.10
2	3	2	34	1546	3	23.00	34.00	2.93	05	0181	281	81	4	32	.25
2	3	2	45	11389	2	21.00	32.00	2.35	04	0182	282	82	2	20	.00
2	3	2	47	1488	3	16.00	34.00	2.90	01	0781	481	81	1	32	-.20
2	3	2	68	10396	2	55.50	32.00	2.98	06	0282	282	82	4	20	.25
2	3	2	61	10659	2	59.00	32.00	2.93	06	0681	381	81	4	20	.25
2	3	2	63	2813	3	15.00	34.00	2.93	03	0181	281	81	3	32	.20
2	3	2	63	11000	2	71.00	32.00	2.88	03	0481	381	81	4	20	.25
2	3	2	69	11757	2	51.50	32.00	2.90	00	0781	481	81	2	20	.00
2	3	2	64	8988	2	94.00	32.00	2.90	00	0382	282	82	5	20	.10
2	3	2	44	11601	2	56.00	32.00	2.88	08	0981	481	81	4	20	.25
2	3	2	24	1235	3	14.00	34.00	2.90	00	1081	182	82	2	32	.00
2	3	2	44	11601	2	65.00	32.00	2.85	25	1181	182	82	6	20	-.05
2	3	2	66	10718	2	77.00	32.00	2.80	02	0182	282	82	4	20	.25
2	3	2	58	1698	3	70.00	34.00	2.87	00	0381	281	81	3	32	.20
2	3	2	53	1784	3	35.50	34.00	2.85	00	0781	481	81	2	32	.00
2	3	2	57	1149	3	20.00	34.00	2.83	02	0282	282	82	3	32	.20
2	3	2	65	11202	2	72.50	32.00	2.90	12	0481	381	81	2	20	.00
2	3	2	65	14001	2	43.00	32.00	2.86	13	0281	281	81	5	20	.10
2	3	2	62	12691	2	32.00	32.00	2.75	05	1181	182	82	2	20	.00
2	3	2	67	9322	2	41.00	32.00	2.84	00	1281	182	82	5	20	.10
2	3	2	45	10014	2	110.50	32.00	2.82	01	0581	381	81	6	20	-.05
2	3	2	70	11757	2	40.00	32.00	2.85	05	0881	481	81	2	20	.00
3	3	2	40	1167	3	8.00	34.00	3.00	03	0782	482	82	1	32	-.20
3	3	2	80	983	2	59.00	32.00	2.88	13	0682	382	82	4	20	.25
3	3	2	70	19445	2	46.50	32.00	2.80	06	0582	382	82	2	20	.00
3	3	2	69	19283	2	72.00	32.00	2.87	05	0782	482	82	3	20	.20
3	3	2	53	15864	2	47.00	32.00	2.95	23	0682	382	82	2	20	.00
3	3	2	73	21687	2	62.00	40.00	2.80	09	0383	283	83	3	22	.20
3	3	2	69	11757	2	49.00	32.00	2.80	02	0383	283	83	2	20	.00
3	3	2	71	26989	2	32.00	40.00	2.95	02	1282	183	83	2	22	.00
3	3	2	80	30685	2	32.50	40.00	2.87	01	1282	183	83	3	22	.20
3	3	2	34	1546	3	10.00	34.00	3.00	03	0183	283	83	2	32	.00
3	3	2	73	17904	2	34.00	32.00	2.93	05	0283	283	83	3	20	.20
3	3	2	69	1729	3	14.00	62.00	2.85	00	0882	482	82	2	33	.00
3	3	2	63	2813	3	8.00	34.00	3.00	01	0183	283	83	1	32	-.20
3	3	2	72	26406	2	71.00	40.00	2.87	03	0882	482	82	3	22	.20
3	3	2	70	26406	2	79.00	40.00	2.90	14	0682	382	82	4	22	.25
3	3	2	72	26406	2	65.50	40.00	2.90	30	0982	482	82	3	22	.20
3	3	2	58	1488	3	11.00	34.00	3.00	03	0383	283	83	2	32	.00
3	3	2	56	1055	3	23.50	62.00	2.95	21	0882	482	82	2	33	.00

3	3	2	65	14001	2	36.00	32.00	2.87	06	0283	283	83	3	20	.20
3	3	2	62	12724	2	46.50	32.00	2.95	07	0782	482	82	2	20	.00
3	3	2	62	12691	2	62.00	32.00	2.87	05	0982	482	82	3	20	.20
3	3	2	81	1553	3	19.00	34.00	2.90	10	0183	283	83	2	32	.00
3	3	2	67	9323	2	54.00	32.00	2.90	06	1262	183	83	2	20	.00
3	3	2	66	9313	2	62.00	32.00	2.93	02	0782	482	82	3	20	.20
3	3	2	80	24336	2	24.00	40.00	2.90	06	0682	382	82	2	22	.00
3	3	2	78	17376	2	33.00	32.00	2.97	00	0462	382	82	3	20	.20
3	3	2	72	41127	2	64.00	40.00	2.95	05	0782	482	82	4	22	.25
3	3	2	58	20538	3	75.00	65.00	2.85	01	0383	283	83	4	35	.25
3	3	2	74	28487	2	72.00	40.00	2.80	06	1282	183	83	2	22	.00
2	3	3	76	287	1	11.00	10.00	2.90	00	0381	281	81	1	10	.00
2	3	3	77	1181	2	18.00	32.00	3.00	04	0581	381	81	1	20	-.20
2	3	3	77	198	1	13.00	16.00	3.30	05	0681	381	81	1	11	.00
2	3	3	73	298	1	6.00	10.00	2.90	04	1081	182	82	1	10	.00
3	3	3	74	197	1	68.00	16.00	2.90	00	0782	482	82	1	11	.00
3	3	3	74	292	1	30.00	16.00	2.90	01	0882	482	82	1	11	.00
3	3	3	73	197	1	22.00	16.00	2.90	03	0383	283	83	3	11	-.20
3	3	3	74	298	1	35.00	16.00	3.10	00	0283	283	83	1	11	.00
3	3	3	71	188	1	36.00	16.00	2.90	00	1082	183	83	1	11	.00
3	3	3	72	188	1	50.00	16.00	2.80	01	0682	382	82	1	11	.00
3	3	3	45	18681	3	73.00	62.00	2.80	02	1182	183	83	1	33	-.20
3	3	3	71	196	1	47.00	16.00	2.80	00	1182	183	83	1	11	.00
3	3	3	74	186	1	11.00	16.00	2.80	06	0882	482	82	1	11	.00
3	3	3	79	282	1	7.00	10.00	2.80	02	0383	283	83	1	10	.00
3	3	3	80	315	2	12.00	32.00	2.90	06	0782	482	82	1	20	-.20
3	3	3	78	299	1	11.00	10.00	2.90	11	0982	482	82	1	10	.00
3	3	3	44	13659	3	120.00	62.00	2.90	07	0682	482	82	1	33	-.20
3	3	3		292	1	44.00	16.00	2.90	00	1082	183	83	1	11	.00
3	3	3	80	5496	4	27.00	32.00	2.90	01	0482	382	82	1	40	-.05
3	3	3	80	297	1	14.00	16.00	2.80	00	0982	482	82	1	11	.00
3	3	3	76	7208	4	34.00	32.00	2.90	00	1082	183	83	1	40	-.05
3	3	3	78	7250	4	62.00	60.00	3.00	22	0782	482	82	1	41	-.05
3	3	3	78	299	1	16.00	16.00	2.70	00	0982	482	82	1	11	.00
3	3	3	79	251	1	9.00	10.00	3.00	00	1082	183	83	1	10	.00
3	3	3	75	4514	4	24.00	32.00	2.90	00	1182	183	83	1	40	-.05
1	4	1	77	117515	3	40.50	44.00	3.15	00	1180	181	81	2	38	.00
2	4	1	77	1181	2	29.50	56.00	2.95	01	0281	281	81	2	21	.00
3	4	3	69	4321	4	18.00	60.00	3.00	00	0782	482	82	1	41	.05
3	4	3	70	290	1	5.00	10.00	3.00	22	0782	482	82	1	10	.00
1	4	1	70	290	1	37.00	16.00	2.95	06	0880	480	80	3	11	.10
3	4	3	70	198	1	33.50	16.00	2.90	18	0982	482	82	1	11	.00
3	4	3	77	13097	2	34.00	56.00	3.00	00	0383	283	83	1	21	-.20
3	4	3	78	3065	4	71.50	60.00	2.90	19	1082	183	83	1	41	-.05
3	4	1	67	280	1	14.00	16.00	3.00	00	0562	382	82	1	11	.00
2	4	1	79	196	1	19.00	16.00	2.90	07	0681	381	81	1	11	.00
3	4	1	78	491	1	10.00	10.00	3.05	00	0482	382	82	2	10	.15
1	4	1	45	11558	2	59.00	32.00	3.05	12	1080	181	81	2	20	.00
3	4	3	76	286	1	63.00	16.00	3.00	12	0562	382	82	1	11	.00
3	4	3	68	6281	4	94.00	60.00	2.97	15	1082	183	83	3	41	.15
3	4	3	70	282	1	8.00	10.00	3.00	00	0782	482	82	1	10	.00
3	4	3	74	491	1	27.00	16.00	3.10	04	1282	183	83	1	11	.00
3	4	3	76	199	1	41.50	10.00	2.90	04	1062	183	83	2	10	.15
3	4	3	78	294	1	51.00	16.00	3.00	01	1282	183	83	1	11	.00
3	4	3	80	289	1	48.00	16.00	3.00	00	1182	183	83	1	11	.00
3	4	3	80	289	1	17.50	16.00	3.00	01	1282	183	83	1	11	.00
3	4	3	80	289	1	33.00	16.00	3.00	00	0183	283	83	2	11	.15
3	4	3	81	315	1	65.00	16.00	3.00	04	0383	283	83	1	11	.00
3	4	3	74	298	1	22.00	16.00	3.00	04	0383	283	83	1	11	.00
3	4	3	45	5508	4	53.50	60.00	2.95	02	0183	283	83	4	41	.05
3	4	3	73	199	1	36.00	16.00	3.20	04	0283	283	83	1	11	.00
2	4	3	73	199	1	14.00	16.00	3.00	00	0281	281	81	1	11	.00
3	4	3	78	197	1	24.00	10.00	3.00	11	0283	283	83	2	10	.15
1	4	1	77	44875	3	68.00	40.00	3.00	20	0780	480	80	2	36	.00
1	4	1	77	83102	5	104.00	42.00	3.03	00	0580	380	80	4	50	.25
2	4	1	77	67948	5	124.00	82.00	3.00	03	0382	282	82	1	51	-.20
1	4	1	77	67948	5	83.00	42.00	2.95	03	0380	280	80	2	50	.00
3	4	3	78	83608	5	129.00	82.00	2.90	01	0582	382	82	1	51	-.20
1	4	1	78	83608	5	123.00	82.00	2.95	02	1180	181	81	2	51	.00
2	4	1	78	83608	5	161.00	82.00	3.00	06	1081	182	82	4	41	.25
1	4	1	78	83608	5	92.00	42.00	3.00	08	0180	280	80	2	50	.00
3	4	1	79	83607	5	25.00	42.00	3.13	06	0482	382	82	3	50	.20

```
3 4 3 79   83729 5 150.00 82.00 3.20 07 0383 283 83 1 51 -.20
1 4 1 79   83729 5 144.00 62.00 3.00 04 0880 480 80 1 51 -.20
2 4 2 79   83729 5 148.00 82.00 3.10 00 0781 481 81 2 51  .00
2 4 1 45   17184 2  28.00 32.00 3.00 78 0182 282 82 2 20  .00
1 4 1 45   17184 2  46.00 56.00 3.00 07 0280 280 80 3 21  .20
3 4 3 77   12159 2  37.00 56.00 3.00 00 0383 283 83 3 21  .20
3 4 1 66   10723 2  31.00 56.00 3.10 00 0482 382 82 2 21  .00
1 4 1 75  117285 3  39.00 44.00 2.95 06 1279 180 80 2 38  .00
2 4 1 77   13155 2  53.00 56.00 3.00 05 1181 182 82 1 21 -.20
2 4 1 45   11302 2 126.00 32.00 2.90 01 0182 282 82 1 20 -.20
1 4 1 45   11302 2  47.00 56.00 3.10 08 0280 280 80 2 21  .00
3 4 1 70     297 1  26.00 16.00 3.00 00 0582 382 82 1 11  .00
3 4 3 74     281 1  15.00 16.00 3.10 11 0183 283 83 2 11  .15
1 4 1 76  117285 3  91.00 86.00 2.95 04 0680 380 80 2 39  .00
3 4 3 80   18503 3 140.00 62.00 3.00 05 0582 382 82 1 33 -.20
3 4 1 45   17184 2  81.00 32.00 3.00 11 0582 382 82 3 20  .20
2 4 1 74     199 1   7.00 16.00 3.00 00 0382 282 82 2 11  .15
1 4 1 78     403 2  12.00 32.00 3.00 02 0980 480 80 1 20 -.20
2 4 1 79     196 1  18.50 16.00 3.00 09 0681 381 81 1 11  .00
2 4 1 65     190 1  29.00 16.00 3.00 01 1281 182 82 1 11  .00
1 4 1 74     197 1  24.50 16.00 3.05 02 1080 181 81 2 11  .15
1 4 1 74     197 1  35.50 16.00 3.00 12 1180 181 81 2 11  .15
1 4 1 45   17192 2  17.00 32.00 3.00 31 0680 380 80 2 20  .00
3 4 3 76   21512 3  59.00 65.00 3.05 00 0882 482 82 2 35  .00
3 4 3 74    8300 4 120.00 60.00 3.10 06 1282 183 83 1 41 -.05
1 4 1 74    8300 4  21.00 60.00 3.00 21 1180 181 81 1 41 -.05
3 4 3 74     491 2 113.00 56.00 3.10 00 1282 183 83 1 21 -.20
1 4 1 74     491 2  44.00 56.00 2.98 02 1080 181 81 1 21 -.20
2 4 1 62   16518 2  69.50 32.00 3.00 00 0281 281 81 3 20  .20
3 4 3 62   16518 2  51.00 32.00 2.95 03 0283 283 83 2 20  .00
3 4 3 73   21457 2 114.00 64.00 2.90 04 1182 183 83 1 23 -.20
3 4 3 73   21467 2 173.00 56.00 2.90 00 0383 283 83 1 21 -.20
2 4 1 73   21467 2  64.50 56.00 2.80 04 0381 281 81 2 21  .00
3 4 3 61   16518 2  88.00 56.00 2.90 00 1182 133 33 1 21 -.20
2 4 1 61   16518 2  97.00 56.00 2.95 03 0281 281 81 2 21  .00
2 4 1 79     297 1   7.00 16.00 3.20 00 0681 381 81 1 11  .00
3 4 1 69     291 1  22.00 16.00 3.00 00 0482 282 82 1 11  .00
2 4 1 73     298 1  21.00 16.00 3.05 00 1081 182 82 2 11  .15
3 4 3 80   24336 2  37.00 64.00 2.90 08 1082 183 83 2 23  .00
1 4 1 78   17376 2  53.00 32.00 3.03 02 0580 380 80 3 20  .20
3 4 3 75    7115 4  69.00 32.00 2.90 01 1182 183 83 2 40  .00
3 4 1 70     297 1  29.00 16.00 3.00 01 0482 382 82 1 11  .00
3 4 1 68   21250 3  67.00 65.00 3.10 01 0582 382 82 2 35  .00
2 4 1 44   15128 3  46.00 62.00 3.10 01 1181 282 82 1 33 -.20
3 4 3 68     181 1  10.00 10.00 2.90 06 1282 183 83 1 10  .00
2 4 1 62   15147 2  98.00 56.00 3.05 03 0481 381 81 2 21  .00
3 4 3 71     199 1  24.50 16.00 3.20 00 0283 283 83 1 11  .00
2 4 1 79     283 1   4.00 16.00 3.20 00 0681 381 81 1 11  .00
2 4 1 74  103812 3 205.00 86.00 3.00 11 1181 182 82 1 39 -.20
3 4 3 76     190 1  25.00 10.00 3.00 19 1082 183 83 1 10  .00
1 4 1 74  103812 3  79.00 86.00 2.90 07 0180 280 80 2 39  .00
3 4 3 80    6499 4  13.00 32.00 3.00 18 0183 283 83 2 40  .10
1 4 3 76   21572 3  53.00 65.00 3.10 03 0580 380 80 2 35  .00
1 4 1 76   21572 3  57.00 65.00 2.90 00 0880 480 80 1 35 -.20
END INPUT DATA
CROSSTABS          TABLES= ITYPE BY CTR
OPTIONS            1,9
STATISTICS         ALL
*IF                 (YEAR EQ 81) FLAG =1
*IF                 (YEAR EQ 82) FLAG =1
*IF                 (YEAR EQ 83) FLAG =1
*SELECT IF         (FLAG EQ 1)
CONDESCRIPTIVE     ACTRK,NU635,ACTMH,STDMH,NUISF,INSCR
OPTIONS            1,4
STATISTICS         ALL
*IF                 (YEAR EQ 81) FLAG =1
*IF                 (YEAR EQ 82) FLAG =1
*IF                 (YEAR EQ 83) FLAG =1
*IF                (VTYPE EQ 1)  FLAG2 =2
*IF                (VTYPE EQ 2)  FLAG2 =2
*IF                (VTYPE EQ 3)  FLAG2 =2
*IF                (VTYPE EQ 4)  FLAG2 =2
```

FILE: DATAEFF SPSS A NAVAL POSTGRADUATE SCHOOL

```
*IF               (ITYPE EQ 1) FLAG3 =3
*IF               (ITYPE EQ 3) FLAG3 =3
*SELECT IF        (FLAG2 EQ 2)
*SELECT IF        (FLAG3 EQ 3)
*SELECT IF        (FLAG EQ 1)
CONDESCRIPTIVE    ACTRK,NU835,ACTMH,STDMH,NLISP,INSCR
OPTIONS           1,4
STATISTICS        ALL
*IF                (YEAR EQ 81) FLAG =1
*IF                (YEAR EQ 82) FLAG =1
*IF                (YEAR EQ 83) FLAG =1
*SELECT IF        (FLAG EQ 1)
*COMPUTE          PCTSTD = ACTMH/STDMH * 100
BREAKDOWN         TABLES = PCTSTD BY QTR/PCTSTD BY YEAR/
                  PCTSTD BY ITYPE/PCTSTD BY VTYPE/
                  PCTSTD BY DATSO/PCTSTD BY ACTRK/
                  PCTSTD BY TIMPD/PCTSTD BY STDCL/
OPTIONS           1
STATISTICS        ALL
*IF                (YEAR EQ 81) FLAG =1
*IF                (YEAR EQ 82) FLAG =1
*IF                (YEAR EQ 83) FLAG =1
*IF               (VTYPE EQ 1) FLAG2 =2
*IF               (VTYPE EQ 2) FLAG2 =2
*IF               (VTYPE EQ 3) FLAG2 =2
*IF               (VTYPE EQ 4) FLAG2 =2
*IF               (ITYPE EQ 1) FLAG3 =3
*IF               (ITYPE EQ 3) FLAG3 =3
*SELECT IF        (FLAG2 EQ 2)
*SELECT IF        (FLAG3 EQ 3)
*SELECT IF        (FLAG EQ 1)
*COMPUTE          PCTSTD = ACTMH/STDMH * 100
BREAKDOWN         TABLES = PCTSTD BY QTR/PCTSTD BY YEAR/
                  PCTSTD BY ITYPE/PCTSTD BY VTYPE/
                  PCTSTD BY DATSO/PCTSTD BY ACTRK/
                  PCTSTD BY TIMPD/PCTSTD BY STDCL/
OPTIONS           1
STATISTICS        ALL
*IF               (STDCL EQ 10) AVGMH = 18.1667
*IF               (STDCL EQ 11) AVGMH = 31.8261
*IF               (STDCL EQ 20) AVGMH = 57.0652
*IF               (STDCL EQ 21) AVGMH = 71.8333
*IF               (STDCL EQ 22) AVGMH = 65.1667
*IF               (STDCL EQ 23) AVGMH = 81.6667
*IF               (STDCL EQ 32) AVGMH = 20.7917
*IF               (STDCL EQ 33) AVGMH = 71.1875
*IF               (STDCL EQ 34) AVGMH = 57.7500
*IF               (STDCL EQ 35) AVGMH = 67.0000
*IF               (STDCL EQ 37) AVGMH =156.5000
*IF               (STDCL EQ 38) AVGMH = 40.5000
*IF               (STDCL EQ 39) AVGMH = 205.0000
*IF               (STDCL EQ 40) AVGMH = 30.2500
*IF               (STDCL EQ 41) AVGMH = 79.1111
*IF               (STDCL EQ 50) AVGMH = 25.0000
*IF               (STDCL EQ 51) AVGMH =134.8000
*IF                (YEAR EQ 81) FLAG =1
*IF                (YEAR EQ 82) FLAG =1
*IF                (YEAR EQ 83) FLAG =1
*IF                (VTYPE EQ 1) FLAG2 =2
*IF                (VTYPE EQ 2) FLAG2 =2
*IF                (VTYPE EQ 3) FLAG2 =2
*IF                (VTYPE EQ 4) FLAG2 =2
*IF               (ITYPE EQ 1) FLAG3 =3
*IF               (ITYPE EQ 3) FLAG3 =3
*SELECT IF        (FLAG EQ 1)
*SELECT IF        (FLAG3 EQ 3)
*SELECT IF        (FLAG2 EQ 2)
*COMPUTE          EFF = (.40*(LN(ACTMH/AVGMH)) + .30*(ACTRK-2.986)
                  +.25*(INSCR) + .05*(LG10(NU835/5.932))) * 100
BREAKDOWN         TABLES = EFF BY QTR/EFF BY QTR BY ITYPE/
                  EFF BY ITYPE/EFF BY YEAR/EFF BY QTR BY VTYPE/
                  EFF BY YEAR BY VTYPE/
```

```
                  EFF BY VTYPE/EFF EY YEAR BY ITYPE/
CPTICNS           1
STATISTICS        ALL
*IF               (STDCL EC 10) AVGMH = 18.1667
*IF               (STDCL EC 11) AVGMH = 31.8261
*IF               (STDCL EC 20) AVGMH = 57.0652
*IF               (STDCL EC 21) AVGMH = 71.8333
*IF               (STDCL EC 22) AVGMH = 65.1667
*IF               (STDCL EC 23) AVGMH = 81.6667
*IF               (STDCL EC 32) AVGMH = 20.7917
*IF               (STDCL EC 33) AVGMH = 71.1875
*IF               (STDCL EC 34) AVGMH = 57.7500
*IF               (STDCL EC 35) AVGMH = 67.0000
*IF               (STDCL EC 37) AVGMH =156.5000
*IF               (STDCL EC 38) AVGMH = 40.500C
*IF               (STDCL EC 39) AVGMH = 205.0000
*IF               (STDCL EC 40) AVGMH = 30.250C
*IF               (STDCL EC 41) AVGMH = 79.1111
*IF               (STDCL EC 50) AVGMH = 25.0000
*IF               (STDCL EC 51) AVGMH =134.800C
*IF                (YEAR EC 81) FLAG =1
*IF                (YEAR EC 82) FLAG =1
*IF                (YEAR EC 83) FLAG =1
*IF                (VTYPE EC 1) FLAG2 =2
*IF                (VTYPE EQ 2) FLAG2 =2
*IF                (VTYPE EQ 3) FLAG2 =2
*IF                (VTYPE EC 4) FLAG2 =2
*IF               (ITYPE EC 1) FLAG3 =3
*IF               (ITYPE EC 3) FLAG3 =3
*SELECT IF        (FLAG EQ 1)
*SELECT IF        (FLAG3 EC 3)
*SELECT IF        (FLAG2 EC 2)
*COMPUTE          EFF = (.40*(LN(ACTMH/STDMH)) + .30*(ACTRK-2.986)
                  +.25*(INSCR) + .C5*(LG10(NU835/5.932))) * 10C
BREAKDOWN         TABLES = EFF BY CTR/EFF BY QTR BY ITYPE/
                  EFF BY ITYPE/EFF EY YEAR/EFF BY QTR BY VTYPE/
                  EFF BY YEAR BY VTYPE/
                  EFF BY VTYPE/EFF EY YEAR BY ITYPE/
CPTIONS           1
STATISTICS        ALL
*IF               (STDCL EC 10) AVGMH = 18.1667
*IF               (STDCL EC 11) AVGMH = 31.8261
*IF               (STDCL EC 20) AVGMH = 57.0652
*IF               (STDCL EC 21) AVGMH = 71.8333
*IF               (STDCL EC 22) AVGMH = 65.1667
*IF               (STDCL EC 23) AVGMH = 81.6667
*IF               (STDCL EC 32) AVGMH = 20.7917
*IF               (STDCL EC 33) AVGMH = 71.1875
*IF               (STDCL EC 34) AVGMH = 57.7500
*IF               (STDCL EC 35) AVGMH = 67.0000
*IF               (STDCL EC 37) AVGMH =156.5000
*IF               (STDCL EC 38) AVGMH = 40.500C
*IF               (STDCL EC 39) AVGMH = 205.0000
*IF               (STDCL EC 40) AVGMH = 30.2500
*IF               (STDCL EC 41) AVGMH = 79.1111
*IF               (STDCL EC 50) AVGMH = 25.0000
*IF               (STDCL EC 51) AVGMH =134.800C
*IF                (YEAR EC 81) FLAG =1
*IF                (YEAR EC 82) FLAG =1
*IF                (YEAR EC 83) FLAG =1
*IF                (VTYPE EQ 1) FLAG2 =2
*IF                (VTYPE EQ 2) FLAG2 =2
*IF                (VTYPE EQ 3) FLAG2 =2
*IF                (VTYPE EC 4) FLAG2 =2
*IF               (ITYPE EC 1) FLAG3 =3
*IF               (ITYPE EC 3) FLAG3 =3
*SELECT IF        (FLAG EQ 1)
*SELECT IF        (FLAG3 EC 3)
*SELECT IF        (FLAG2 EC 2)
*COMPUTE          EFF = (.25*(LN(ACTMH/AVGMH)) + .25*(ACTRK-2.986)
                  +.25*(INSCR) + .25*(LG10(NU835/5.932))) * 10C
BREAKDOWN         TABLES = EFF BY CTR/EFF BY QTR BY ITYPE/
```

```
                EFF BY ITYPE/EFF BY YEAR/EFF BY CTR BY VTYPE/
                EFF BY YEAR BY VTYPE/
                EFF BY VTYPE/EFF BY YEAR BY ITYPE/
OPTIONS         1
STATISTICS      ALL
*IF             (STDCL EQ 10) AVGMH = 18.1667
*IF             (STDCL EQ 11) AVGMH = 31.8261
*IF             (STDCL EQ 20) AVGMH = 57.0652
*IF             (STDCL EQ 21) AVGMH = 71.8333
*IF             (STDCL EQ 22) AVGMH = 65.1667
*IF             (STDCL EQ 23) AVGMH = 81.6667
*IF             (STDCL EQ 32) AVGMH = 20.7917
*IF             (STDCL EQ 33) AVGMH = 71.1875
*IF             (STDCL EQ 34) AVGMH = 57.7500
*IF             (STDCL EQ 35) AVGMH = 67.0000
*IF             (STDCL EQ 37) AVGMH =156.5000
*IF             (STDCL EQ 38) AVGMH = 40.5000
*IF             (STDCL EQ 39) AVGMH = 205.0000
*IF             (STDCL EQ 40) AVGMH = 30.2500
*IF             (STDCL EQ 41) AVGMH = 79.1111
*IF             (STDCL EQ 50) AVGMH = 25.0000
*IF             (STDCL EQ 51) AVGMH =134.8000
*IF              (YEAR EQ 81) FLAG =1
*IF              (YEAR EQ 82) FLAG =1
*IF              (YEAR EQ 83) FLAG =1
*IF              (VTYPE EQ 1) FLAG2 =2
*IF              (VTYPE EQ 2) FLAG2 =2
*IF              (VTYPE EQ 3) FLAG2 =2
*IF              (VTYPE EQ 4) FLAG2 =2
*IF             (ITYPE EQ 1) FLAG3 =3
*IF             (ITYPE EQ 3) FLAG3 =3
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (FLAG3 EQ 3)
*SELECT IF      (FLAG2 EQ 2)
*COMPUTE        EFF = (.25*(LN(ACTMH/STDMH)) + .25*(ACTRK-2.986)
                +.25*(INSCR) + .25*(LG10(NU835/5.932))) * 100
BREAKDOWN       TABLES = EFF BY CTR/EFF BY QTR BY ITYPE/
                EFF BY ITYPE/EFF BY YEAR/EFF BY CTR BY VTYPE/
                EFF BY YEAR BY VTYPE/
                EFF BY VTYPE/EFF BY YEAR BY ITYPE/
OPTIONS         1
STATISTICS      ALL
*IF             (STDCL EQ 10) AVGMH = 18.1667
*IF             (STDCL EQ 11) AVGMH = 31.8261
*IF             (STDCL EQ 20) AVGMH = 57.0652
*IF             (STDCL EQ 21) AVGMH = 71.8333
*IF             (STDCL EQ 22) AVGMH = 65.1667
*IF             (STDCL EQ 23) AVGMH = 81.6667
*IF             (STDCL EQ 32) AVGMH = 20.7917
*IF             (STDCL EQ 33) AVGMH = 71.1875
*IF             (STDCL EQ 34) AVGMH = 57.7500
*IF             (STDCL EQ 35) AVGMH = 67.0000
*IF             (STDCL EQ 37) AVGMH =156.5000
*IF             (STDCL EQ 38) AVGMH = 40.5000
*IF             (STDCL EQ 39) AVGMH = 205.0000
*IF             (STDCL EQ 40) AVGMH = 30.2500
*IF             (STDCL EQ 41) AVGMH = 79.1111
*IF             (STDCL EQ 50) AVGMH = 25.0000
*IF             (STDCL EQ 51) AVGMH =134.8000
*IF              (YEAR EQ 81) FLAG =1
*IF              (YEAR EQ 82) FLAG =1
*IF              (YEAR EQ 83) FLAG =1
*SELECT IF      (FLAG EQ 1)
*COMPUTE         EFF =(.40*(LN(ACTMH/AVGMH)) + .30*(ACTRK -2.956)
                + .25*(INSCR) + .05*(LG10(NU835/5.670)))* 100
BREAKDOWN       TABLES = EFF BY CTR/EFF BY QTR BY ITYPE/EFF BY ITYPE/
                EFF BY YEAR/EFF BY QTR BY VTYPE/EFF BY YEAR BY VTYPE/
                EFF BY VTYPE/
OPTIONS         1
STATISTICS      ALL
*IF              (YEAR EQ 81) FLAG =1
*IF              (YEAR EQ 82) FLAG =1
```

```
*IF              (YEAR EQ 83) FLAG =1
*SELECT IF       (FLAG EQ 1)
BREAKDOWN        TABLES = ACTMH BY STDCL/NU835 BY VTYPE/
                 NU835 BY VTYPE BY STDCL/
OPTIONS          1
STATISTICS       ALL
*IF               (YEAR EQ 81) FLAG =1
*IF               (YEAR EQ 82) FLAG =1
*IF               (YEAR EQ 83) FLAG =1
*IF              (VTYPE EQ 1) FLAG2 =2
*IF              (VTYPE EQ 2) FLAG2 =2
*IF              (VTYPE EQ 3) FLAG2 =2
*IF              (VTYPE EQ 4) FLAG2 =2
*IF              (ITYPE EQ 1) FLAG3 =3
*IF              (ITYPE EQ 3) FLAG3 =3
*SELECT IF       (FLAG EQ 1)
*SELECT IF       (FLAG2 EQ 2)
*SELECT IF       (FLAG3 EQ 3)
BREAKDOWN        TABLES = ACTMH BY STDCL/NU835 BY VTYPE/
                 NU835 BY VTYPE BY STDCL/
OPTIONS          1
STATISTICS       ALL
*IF              (STDCL EQ 10) AVGMH = 18.1667
*IF              (STDCL EQ 11) AVGMH = 31.8261
*IF              (STDCL EQ 20) AVGMH = 57.0652
*IF              (STDCL EQ 21) AVGMH = 71.8333
*IF              (STDCL EQ 22) AVGMH = 65.1667
*IF              (STDCL EQ 23) AVGMH = 81.6667
*IF              (STDCL EQ 32) AVGMH = 20.7917
*IF              (STDCL EQ 33) AVGMH = 71.1875
*IF              (STDCL EQ 34) AVGMH = 57.7500
*IF              (STDCL EQ 35) AVGMH = 67.0000
*IF              (STDCL EQ 37) AVGMH = 156.5000
*IF              (STDCL EQ 38) AVGMH = 40.5000
*IF              (STDCL EQ 39) AVGMH = 205.0000
*IF              (STDCL EQ 40) AVGMH = 30.2500
*IF              (STDCL EQ 41) AVGMH = 79.1111
*IF              (STDCL EQ 50) AVGMH = 25.0000
*IF              (STDCL EQ 51) AVGMH = 134.8000
*IF              (YEAR EQ 81) FLAG = 1
*IF              (YEAR EQ 82) FLAG = 1
*IF              (YEAR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*COMPUTE         EFF = (.40*(LN(ACTMH/AVGMH)) + .30*(ACTRK-2.956)
                 + .25*(INSCR) +.05*(LG10(NU835/5.670)))*100
SCATTERGRAM      EFF WITH ACTMH/EFF WITH ACTRK (2,4)/EFF WITH INSCR (-1,1)/
                 EFF WITH NU835/
OPTIONS          1,7,8
STATISTICS       ALL
*IF              (STDCL EQ 10) AVGMH = 18.1667
*IF              (STDCL EQ 11) AVGMH = 31.8261
*IF              (STDCL EQ 20) AVGMH = 57.0652
*IF              (STDCL EQ 21) AVGMH = 71.8333
*IF              (STDCL EQ 22) AVGMH = 65.1667
*IF              (STDCL EQ 23) AVGMH = 81.6667
*IF              (STDCL EQ 32) AVGMH = 20.7917
*IF              (STDCL EQ 33) AVGMH = 71.1875
*IF              (STDCL EQ 34) AVGMH = 57.7500
*IF              (STDCL EQ 35) AVGMH = 67.0000
*IF              (STDCL EQ 37) AVGMH = 156.5000
*IF              (STDCL EQ 38) AVGMH = 40.5000
*IF              (STDCL EQ 39) AVGMH = 205.0000
*IF              (STDCL EQ 40) AVGMH = 30.2500
*IF              (STDCL EQ 41) AVGMH = 79.1111
*IF              (STDCL EQ 50) AVGMH = 25.0000
*IF              (STDCL EQ 51) AVGMH = 134.8000
*IF              (YEAR EQ 81) FLAG = 1
*IF              (YEAR EQ 82) FLAG = 1
*IF              (YEAR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*COMPUTE         EFF = (LN(ACTMH/AVGMH))*100
SCATTERGRAM      EFF WITH ACTMH/
```

```
OPTIONS          1,7,8
STATISTICS       ALL
*IF              (STDCL EQ 10) AVGMH = 18.1667
*IF              (STDCL EQ 11) AVGMH = 31.8261
*IF              (STDCL EQ 20) AVGMH = 57.0652
*IF              (STDCL EQ 21) AVGMH = 71.8333
*IF              (STDCL EQ 22) AVGMH = 65.1667
*IF              (STDCL EQ 23) AVGMH = 81.6667
*IF              (STDCL EQ 32) AVGMH = 20.7917
*IF              (STDCL EQ 33) AVGMH = 71.1875
*IF              (STDCL EQ 34) AVGMH = 57.7500
*IF              (STDCL EQ 35) AVGMH = 67.0000
*IF              (STDCL EQ 37) AVGMH = 156.5000
*IF              (STDCL EQ 38) AVGMH = 40.5000
*IF              (STDCL EQ 39) AVGMH = 205.0000
*IF              (STDCL EQ 40) AVGMH = 30.2500
*IF              (STDCL EQ 41) AVGMH = 79.1111
*IF              (STDCL EQ 50) AVGMH = 25.0000
*IF              (STDCL EQ 51) AVGMH = 134.8000
*IF              (YEAR EQ 81) FLAG = 1
*IF              (YEAR EQ 82) FLAG = 1
*IF              (YEAR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*COMPUTE         EFF = (ACTRK-2.956)*100
SCATTERGRAM      EFF WITH ACTRK (2,4)/
OPTIONS          1,7,8
STATISTICS       ALL
*IF              (STDCL EQ 10) AVGMH = 18.1667
*IF              (STDCL EQ 11) AVGMH = 31.8261
*IF              (STDCL EQ 20) AVGMH = 57.0652
*IF              (STDCL EQ 21) AVGMH = 71.8333
*IF              (STDCL EQ 22) AVGMH = 65.1667
*IF              (STDCL EQ 23) AVGMH = 81.6667
*IF              (STDCL EQ 32) AVGMH = 20.7917
*IF              (STDCL EQ 33) AVGMH = 71.1875
*IF              (STDCL EQ 34) AVGMH = 57.7500
*IF              (STDCL EQ 35) AVGMH = 67.0000
*IF              (STDCL EQ 37) AVGMH = 156.5000
*IF              (STDCL EQ 38) AVGMH = 40.5000
*IF              (STDCL EQ 39) AVGMH = 205.0000
*IF              (STDCL EQ 40) AVGMH = 30.2500
*IF              (STDCL EQ 41) AVGMH = 79.1111
*IF              (STDCL EQ 50) AVGMH = 25.0000
*IF              (STDCL EQ 51) AVGMH = 134.8000
*IF              (YEAR EQ 81) FLAG = 1
*IF              (YEAR EQ 82) FLAG = 1
*IF              (YEAR EQ 83) FLAG = 1
*SELECT IF       (FLAG EQ 1)
*COMPUTE         EFF = (INSCR)*100
SCATTERGRAM      EFF WITH INSCR (-1,1)/EFF WITH NUISP (0,7)/
OPTIONS          1,7,8
STATISTICS       ALL
*IF              (STDCL EQ 10) AVGMH = 18.1667
*IF              (STDCL EQ 11) AVGMH = 31.8261
*IF              (STDCL EQ 20) AVGMH = 57.0652
*IF              (STDCL EQ 21) AVGMH = 71.8333
*IF              (STDCL EQ 22) AVGMH = 65.1667
*IF              (STDCL EQ 23) AVGMH = 81.6667
*IF              (STDCL EQ 32) AVGMH = 20.7917
*IF              (STDCL EQ 33) AVGMH = 71.1875
*IF              (STDCL EQ 34) AVGMH = 57.7500
*IF              (STDCL EQ 35) AVGMH = 67.0000
*IF              (STDCL EQ 37) AVGMH = 156.5000
*IF              (STDCL EQ 38) AVGMH = 40.5000
*IF              (STDCL EQ 39) AVGMH = 205.0000
*IF              (STDCL EQ 40) AVGMH = 30.2500
*IF              (STDCL EQ 41) AVGMH = 79.1111
*IF              (STDCL EQ 50) AVGMH = 25.0000
*IF              (STDCL EQ 51) AVGMH = 134.8000
*IF              (YEAR EQ 81) FLAG = 1
*IF              (YEAR EQ 82) FLAG = 1
*IF              (YEAR EQ 83) FLAG = 1
```

```
*SELECT IF      (FLAG EQ 1)
*COMPUTE        EFF = (LG10(NU835/5.670)) *100
SCATTERGRAM     EFF WITH NU835/
CPTICNS         1,7,8
STATISTICS      ALL
*IF             (STDCL EC 10) AVGMH = 18.1667
*IF             (STDCL EC 11) AVGMH = 31.8261
*IF             (STDCL EC 20) AVGMH = 57.0652
*IF             (STDCL EC 21) AVGMH = 71.8333
*IF             (STDCL EC 22) AVGMH = 65.1667
*IF             (STDCL EC 23) AVGMH = 81.6667
*IF             (STDCL EC 32) AVGMH = 20.7917
*IF             (STDCL EC 33) AVGMH = 71.1875
*IF             (STDCL EC 34) AVGMH = 57.7500
*IF             (STDCL EC 35) AVGMH = 67.0000
*IF             (STDCL EC 37) AVGMH = 156.5000
*IF             (STDCL EC 38) AVGMH = 40.5000
*IF             (STDCL EC 39) AVGMH = 205.0000
*IF             (STDCL EC 40) AVGMH = 30.2500
*IF             (STDCL EC 41) AVGMH = 79.1111
*IF             (STDCL EC 50) AVGMH = 25.0000
*IF             (STDCL EC 51) AVGMH = 134.8000
*IF             (YEAR EQ 81) FLAG = 1
*IF             (YEAR EQ 82) FLAG = 1
*IF             (YEAR EQ 83) FLAG = 1
*IF             (VTYPE EC 1) FLAG2 =2
*IF             (VTYPE EC 2) FLAG2 =2
*IF             (VTYPE EC 3) FLAG2 =2
*IF             (VTYPE EC 4) FLAG2 =2
*IF             (ITYPE EC 1) FLAG3 =3
*IF             (ITYPE EC 3) FLAG3 =3
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (FLAG2 EC 2)
*SELECT IF      (FLAG3 EC 3)
*COMPUTE        EFF = (.40*(LN(ACTMH/AVGMH)) + .30*(ACTRK-2.986)
                + .25*(INSCR) +.05*(LG10(NU835/5.932)))*100
SCATTERGRAM     EFF WITH ACTMH/EFF WITH ACTRK (2,4)/EFF WITH INSCR (-1,1)/
                EFF WITH NU835/
CPTICNS         1,7,8
STATISTICS      ALL
*IF             (STDCL EC 10) AVGMH = 18.1667
*IF             (STDCL EC 11) AVGMH = 31.8261
*IF             (STDCL EC 20) AVGMH = 57.0652
*IF             (STDCL EC 21) AVGMH = 71.8333
*IF             (STDCL EC 22) AVGMH = 65.1667
*IF             (STDCL EC 23) AVGMH = 81.6667
*IF             (STDCL EC 32) AVGMH = 20.7917
*IF             (STDCL EC 33) AVGMH = 71.1875
*IF             (STDCL EC 34) AVGMH = 57.7500
*IF             (STDCL EC 35) AVGMH = 67.0000
*IF             (STDCL EC 37) AVGMH = 156.5000
*IF             (STDCL EC 38) AVGMH = 40.5000
*IF             (STDCL EC 39) AVGMH = 205.0000
*IF             (STDCL EC 40) AVGMH = 30.2500
*IF             (STDCL EC 41) AVGMH = 79.1111
*IF             (STDCL EC 50) AVGMH = 25.0000
*IF             (STDCL EC 51) AVGMH = 134.8000
*IF             (YEAR EQ 81) FLAG = 1
*IF             (YEAR EQ 82) FLAG = 1
*IF             (YEAR EQ 83) FLAG = 1
*IF             (VTYPE EC 1) FLAG2 =2
*IF             (VTYPE EC 2) FLAG2 =2
*IF             (VTYPE EC 3) FLAG2 =2
*IF             (VTYPE EC 4) FLAG2 =2
*IF             (ITYPE EC 1) FLAG3 =3
*IF             (ITYPE EC 3) FLAG3 =3
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (FLAG2 EC 2)
*SELECT IF      (FLAG3 EC 3)
*COMPUTE        EFF = (LN(ACTMH/AVGMH))*100
SCATTERGRAM     EFF WITH ACTMH/
CPTIONS         1,7,8
```

```
STATISTICS      ALL
*IF             (STDCL EC 10) AVGMH = 18.1667
*IF             (STDCL EC 11) AVGMH = 31.8261
*IF             (STDCL EC 20) AVGMH = 57.0652
*IF             (STDCL EC 21) AVGMH = 71.8333
*IF             (STDCL EC 22) AVGMH = 65.1667
*IF             (STDCL EC 23) AVGMH = 81.6667
*IF             (STDCL EC 32) AVGMH = 20.7917
*IF             (STDCL EC 33) AVGMH = 71.1875
*IF             (STDCL EC 34) AVGMH = 57.7500
*IF             (STDCL EC 35) AVGMH = 67.0000
*IF             (STDCL EC 37) AVGMH = 156.5000
*IF             (STDCL EC 38) AVGMH = 40.5000
*IF             (STDCL EC 39) AVGMH = 205.0000
*IF             (STDCL EC 40) AVGMH = 30.2500
*IF             (STDCL EC 41) AVGMH = 79.1111
*IF             (STDCL EC 50) AVGMH = 25.0000
*IF             (STDCL EC 51) AVGMH = 134.8000
*IF             (YEAR EC 81) FLAG = 1
*IF             (YEAR EQ 82) FLAG = 1
*IF             (YEAR EQ 83) FLAG = 1
*IF             (VTYPE EC 1) FLAG2 =2
*IF             (VTYPE EC 2) FLAG2 =2
*IF             (VTYPE EC 3) FLAG2 =2
*IF             (VTYPE EC 4) FLAG2 =2
*IF             (ITYPE EC 1) FLAG3 =3
*IF             (ITYPE EC 3) FLAG3 =3
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (FLAG2 EC 2)
*SELECT IF      (FLAG3 EC 3)
*COMPUTE        EFF = (ACTRK-2.966) *100
SCATTERGRAM     EFF WITH ACTRK (2,4)/
CPTIONS         1,7,8
STATISTICS      ALL
*IF             (STDCL EC 10) AVGMH = 18.1667
*IF             (STDCL EC 11) AVGMH = 31.8261
*IF             (STDCL EC 20) AVGMH = 57.0652
*IF             (STDCL EC 21) AVGMH = 71.8333
*IF             (STDCL EC 22) AVGMH = 65.1667
*IF             (STDCL EC 23) AVGMH = 81.6667
*IF             (STDCL EC 32) AVGMH = 20.7917
*IF             (STDCL EC 33) AVGMH = 71.1875
*IF             (STDCL EC 34) AVGMH = 57.7500
*IF             (STDCL EC 35) AVGMH = 67.0000
*IF             (STDCL EC 37) AVGMH = 156.5000
*IF             (STDCL EC 38) AVGMH = 40.5000
*IF             (STDCL EC 39) AVGMH = 205.0000
*IF             (STDCL EC 40) AVGMH = 30.2500
*IF             (STDCL EC 41) AVGMH = 79.1111
*IF             (STDCL EC 50) AVGMH = 25.0000
*IF             (STDCL EC 51) AVGMH = 134.8000
*IF             (YEAR EQ 81) FLAG = 1
*IF             (YEAR EQ 82) FLAG = 1
*IF             (YEAR EQ 83) FLAG = 1
*IF             (VTYPE EC 1) FLAG2 =2
*IF             (VTYPE EC 2) FLAG2 =2
*IF             (VTYPE EC 3) FLAG2 =2
*IF             (VTYPE EC 4) FLAG2 =2
*IF             (ITYPE EC 1) FLAG3 =3
*IF             (ITYPE EC 3) FLAG3 =3
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (FLAG2 EC 2)
*SELECT IF      (FLAG3 EC 3)
*COMPUTE        EFF = (INSCR) * 100
SCATTERGRAM     EFF WITH INSCR (-1,1)/EFF WITH NUISP (0,7)/
CPTIONS         1,7,8
STATISTICS      ALL
*IF             (STDCL EC 10) AVGMH = 18.1667
*IF             (STDCL EC 11) AVGMH = 31.8261
*IF             (STDCL EC 20) AVGMH = 57.0652
*IF             (STDCL EC 21) AVGMH = 71.8333
*IF             (STDCL EC 22) AVGMH = 65.1667
```

FILE: CATAEFF SPSS A NAVAL POSTGRADUATE SCHOOL

```
*IF             (STDCL EQ 23) AVGMH = 81.6667
*IF             (STDCL EQ 32) AVGMH = 20.7917
*IF             (STDCL EQ 33) AVGMH = 71.1875
*IF             (STDCL EQ 34) AVGMH = 57.7500
*IF             (STDCL EQ 35) AVGMH = 67.0000
*IF             (STDCL EQ 37) AVGMH = 156.5000
*IF             (STDCL EQ 38) AVGMH = 40.5000
*IF             (STDCL EQ 39) AVGMH = 205.0000
*IF             (STDCL EQ 40) AVGMH = 30.2500
*IF             (STDCL EQ 41) AVGMH = 79.1111
*IF             (STDCL EQ 50) AVGMH = 25.0000
*IF             (STDCL EQ 51) AVGMH = 134.8000
*IF             (YEAR EQ 81) FLAG = 1
*IF             (YEAR EQ 82) FLAG = 1
*IF             (YEAR EQ 83) FLAG = 1
*IF             (VTYPE EQ 1) FLAG2 =2
*IF             (VTYPE EQ 2) FLAG2 =2
*IF             (VTYPE EQ 3) FLAG2 =2
*IF             (VTYPE EQ 4) FLAG2 =2
*IF             (ITYPE EQ 1) FLAG3 =3
*IF             (ITYPE EQ 3) FLAG3 =3
*SELECT IF      (FLAG EQ 1)
*SELECT IF      (FLAG2 EQ 2)
*SELECT IF      (FLAG3 EQ 3)
*COMPUTE        EFF = (LG10(NU835/5.932))*100
SCATTERGRAM     EFF WITH NU835/
OPTIONS         1,7,8
STATISTICS      ALL
FINISH
```

APPENDIX C: COMPUTER TABLES AND LISTINGS

SPSS BATCH SYSTEM APPENDIX C

11/30/83 FILE - MASTER1 - CREATED 11/30/83

RANK RANK OF INSPECTOR (FY-81)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	2.	41	9.8	9.8	9.8
	3.	154	36.9	36.9	46.8
	4.	113	27.1	27.1	73.9
	5.	31	7.4	7.4	81.3
	6.	8	1.9	1.9	83.2
	11.	1	0.2	0.2	83.5
	12.	2	0.5	0.5	83.9
	22.	20	4.8	4.8	88.7
	23.	24	5.8	5.8	94.5
	24.	23	5.5	5.5	100.0
	TOTAL	417	100.0	100.0	

```
SPSS BATCH SYSTEM
11/30/83            FILE - MASTER1  - CREATED 11/30/83

RANK        RANK OF INSPECTOR ( FY-81 )

      CODE
             I
        2.   *********** (      41)
             I
             I
        3.   **************************************** (     154)
             I
             I
        4.   ***************************** (     113)
             I
             I
        5.   ********* (      31)
             I
             I
        6.   *** (       8)
             I
             I
       11.   * (       1)
             I
             I
       12.   ** (       2)
             I
             I
       22.   ****** (      20)
             I
             I
       23.   ******* (      24)
             I
             I
       24.   ******* (      23)
             I
             I
             I.........I.........I.........I.........I.........I
             0        40        80       120       160       200
             FREQUENCY

MEAN            6.662      STD ERR         0.356      MEDIAN          3.619
MODE            3.000      STD DEV         7.263      VARIANCE       52.758
KURTOSIS        1.316      SKEWNESS        1.784      RANGE          22.000
MINIMUM         2.000      MAXIMUM        24.000

VALID CASES       417      MISSING CASES       0
```

SPSS BATCH SYSTEM

11/30/83 FILE - MASTER1 - CREATED 11/30/83

RANK RANK OF INSPECTOR (FY-82)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	1.	2	0.4	0.4	0.4
	2.	33	6.5	6.5	6.9
	3.	217	43.0	43.0	49.9
	4.	115	22.8	22.8	72.7
	5.	11	2.2	2.2	74.9
	6.	31	6.1	6.1	81.0
	12.	3	0.6	0.6	81.6
	17.	2	0.4	0.4	82.0
	22.	43	8.5	8.5	90.5
	23.	21	4.2	4.2	94.7
	24.	27	5.3	5.3	100.0
	TOTAL	505	100.0	100.0	

```
SPSS BATCH SYSTEM
11/30/83          FILE - MASTER1  - CREATED 11/30/83

RANK      RANK OF INSPECTOR (FY-82)

     CODE
          I
       1. * (      2)
          I
          I
       2. **** (     33)
          I
          I
       3. ********************** (    217)
          I
          I
       4. ************ (    115)
          I
          I
       5. ** (     11)
          I
          I
       6. **** (     31)
          I
          I
      12. * (      3)
          I
          I
      17. * (      2)
          I
          I
      22. ***** (     43)
          I
          I
      23. *** (     21)
          I
          I
      24. **** (     27)
          I
          I
          I.........I.........I.........I.........I.........I
          0        100       200       300       400       500
          FREQUENCY

MEAN          7.063      STD ERR       0.335      MEDIAN        3.504
MODE          3.000      STD DEV       7.534      VARIANCE     56.758
KURTOSIS      0.617      SKEWNESS      1.580      RANGE        23.000
MINIMUM       1.000      MAXIMUM      24.000

VALID CASES     505      MISSING CASES     0
```

SPSS BATCH SYSTEM

11/30/83 FILE - MASTER1 - CREATED 11/30/83

RANK RANK OF INSPECTOR (FY-83)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	1.	10	3.3	3.3	3.3
	2.	48	15.6	15.6	18.9
	3.	119	38.8	38.8	57.7
	4.	28	9.1	9.1	66.8
	5.	3	1.0	1.0	67.8
	12.	1	0.3	0.3	68.1
	13.	1	0.3	0.3	68.4
	17.	7	2.3	2.3	70.7
	22.	60	19.5	19.5	90.2
	23.	18	5.9	5.9	96.1
	24.	12	3.9	3.9	100.0
	TOTAL	307	100.0	100.0	

```
SPSS BATCH SYSTEM
11/30/83           FILE - MASTER1  - CREATED 11/30/83

RANK       RANK OF INSPECTOR (FY-83)

     CODE
           I
       1.  **** (      10)
           I
           I
       2.  ************* (      48)
           I
           I
       3.  ******************************* (     119)
           I
           I
       4.  ******** (      28)
           I
           I
       5.  ** (       3)
           I
           I
      12.  * (       1)
           I
           I
      13.  * (       1)
           I
           I
      17.  *** (       7)
           I
           I
      22.  **************** (      60)
           I
           I
      23.  ****** (      18)
           I
           I
      24.  **** (      12)
           I
           I
           I.........I.........I.........I.........I.........I
           0        40        80       120       160       200
           FREQUENCY

MEAN          8.977      STD ERR       0.514      MEDIAN        3.303
MODE          3.000      STD DEV       9.014      VARIANCE     81.256
KURTOSIS     -1.320      SKEWNESS      0.791      RANGE        23.000
MINIMUM       1.000      MAXIMUM      24.000

VALID CASES     307      MISSING CASES      0
```

SPSS BATCH SYSTEM

11/30/83 FILE - MASTER1 - CREATED 11/30/83

RANK RANK OF INSPECTOR (CUMULATIVE FY 81-83)

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
	1.	12	1.0	1.0	1.0
	2.	122	9.9	9.9	10.9
	3.	490	39.9	39.9	50.8
	4.	256	20.8	20.8	71.6
	5.	45	3.7	3.7	75.3
	6.	39	3.2	3.2	78.4
	11.	1	0.1	0.1	78.5
	12.	6	0.5	0.5	79.0
	13.	1	0.1	0.1	79.1
	17.	9	0.7	0.7	79.8
	22.	123	10.0	10.0	89.8
	23.	63	5.1	5.1	95.0
	24.	62	5.0	5.0	100.0
	TOTAL	1229	100.0	100.0	

```
SPSS BATCH SYSTEM
11/30/83          FILE - MASTER1  - CREATED 11/30/83

RANK      RANK OF INSPECTOR (CUMULATIVE FY 81-83)

     CODE
          I
      1.  ** (     12)
          I
          I
      2.  ************* (     122)
          I
          I
      3.  ************************************************** (     490)
          I
          I
      4.  ************************** (     256)
          I
          I
      5.  ****** (     45)
          I
          I
      6.  ***** (     39)
          I
          I
     11.  * (      1)
          I
          I
     12.  ** (      6)
          I
          I
     13.  * (      1)
          I
          I
     17.  ** (      9)
          I
          I
     22.  ************* (     123)
          I
          I
     23.  ******* (     63)
          I
          I
     24.  ******* (     62)
          I
          I
          I.........I.........I.........I.........I.........I
          0        100       200       300       400       500
          FREQUENCY
```

SPSS BATCH SYSTEM 11/30/83

FILE MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - -

CRITERION VARIABLE MMAN MANHOURS AVAILABLE FOR WORK
BROKEN DOWN BY QTR QUARTER AND FISCAL YEAR
BY DIST COAST GUARD DISTRICT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			192588.0794	251.5228	325.9634	106836.2676	(662)
QTR	181.		6714.0499	217.8512	257.6565	66407.4754	(40)
DIST	1.		972.0000	486.0000	494.9747	245000.0000	(2)
DIST	5.		662.5000	331.2500	274.7110	75466.1250	(2)
DIST	8.		192.6000	96.3000	84.2164	7092.4039	(2)
DIST	11.		1642.7500	821.3750	304.9358	92986.2813	(2)
DIST	12.		678.0000	678.0000	0.0	0.0	(1)
DIST	17.		69.3000	69.3000	0.0	0.0	(1)
DIST	30.		614.2500	307.1250	175.5393	30814.0313	(2)
DIST	31.		1291.1500	99.3192	53.9967	2914.9910	(13)
DIST	33.		2591.4999	172.7667	225.0514	50938.5945	(15)
QTR	182.		14067.2995	213.1409	210.6636	44375.1437	(66)
DIST	1.		1143.0000	1143.0000	0.0	0.0	(1)
DIST	3.		309.5000	154.7500	133.0896	17766.1250	(2)
DIST	8.		2965.3500	185.3344	144.6433	20922.3121	(16)
DIST	12.		1830.7500	366.3500	256.0288	65621.1750	(5)
DIST	13.		37.0000	37.0000	0.0	0.0	(1)
DIST	14.		2235.6000	279.4500	189.2353	35810.0092	(8)
DIST	30.		223.0000	223.0000	0.0	0.0	(1)
DIST	31.		1349.7999	134.9800	102.7782	10563.3610	(10)
DIST	32.		173.5000	57.8333	38.7976	1505.2708	(3)
DIST	33.		2643.7997	240.3454	215.0511	46269.1657	(11)
DIST	36.		915.7500	305.2500	119.6268	14310.5625	(3)
DIST	37.		264.2500	52.8500	23.3624	545.4127	(5)
QTR	183.		32105.1482	401.3144	402.4646	161977.7553	(80)
DIST	1.		1462.4999	162.5000	170.8958	29205.3914	(9)
DIST	2.		1185.7000	1185.7000	0.0	0.0	(1)
DIST	3.		9043.5495	335.0204	296.3219	87806.5881	(27)
DIST	5.		1432.0000	1432.0000	0.0	0.0	(1)
DIST	7.		936.7000	936.7000	0.0	0.0	(1)
DIST	8.		2209.2997	138.0812	130.0865	16922.4950	(16)
DIST	9.		88.5000	88.5000	0.0	0.0	(1)
DIST	11.		2222.2000	1111.1000	325.4105	105891.3975	(2)
DIST	12.		1439.5000	719.7500	615.3720	383250.1250	(2)
DIST	13.		1374.4498	274.8900	396.2047	156966.9717	(5)
DIST	14.		10516.5495	751.1821	357.2339	127842.4766	(14)
DIST	17.		192.2000	192.2000	0.0	0.0	(1)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHAW

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
CTR	281.		17243.3952	297.3000	390.3376	152363.4247	(58)
DIST	1.		1808.8499	452.2125	478.9849	229426.5563	(4)
DIST	3.		177.6000	88.8000	61.9425	3836.8752	(2)
DIST	5.		1415.7999	471.9333	254.7500	64897.5771	(3)
DIST	7.		700.5000	700.5000	0.0	0.0	(1)
DIST	8.		546.0500	109.2100	82.6674	6833.8945	(5)
DIST	11.		821.8500	410.9250	543.8712	295795.6083	(2)
DIST	12.		3111.5000	622.3000	336.8194	56606.6088	(5)
DIST	17.		543.5000	543.5000	0.0	0.0	(1)
DIST	30.		769.0000	769.0000	0.0	0.0	(1)
DIST	31.		1479.8000	82.2111	56.6579	3210.1229	(18)
DIST	32.		42.0000	42.0000	0.0	0.0	(1)
DIST	33.		1464.6996	122.0583	133.8517	17916.2753	(12)
DIST	36.		4362.2498	1454.0833	291.3455	84882.2713	(3)
CTR	282.		21651.4487	277.5827	321.6053	103429.9819	(78)
DIST	1.		371.7000	123.9000	96.6484	9340.9220	(3)
DIST	2.		325.2000	325.2000	0.0	0.0	(1)
DIST	3.		139.5000	69.7500	9.5459	91.1250	(2)
DIST	5.		816.5000	816.5000	0.0	0.0	(1)
DIST	7.		294.2500	98.0833	112.2738	12605.3956	(3)
DIST	8.		2424.6998	142.6294	89.8382	8070.8958	(17)
DIST	11.		1615.7000	807.8500	152.2401	23177.0555	(2)
DIST	12.		2917.6499	324.1833	254.7303	64887.5251	(9)
DIST	14.		4041.2995	808.2599	724.0672	524302.2032	(5)
DIST	30.		248.5000	248.5000	0.0	0.0	(1)
DIST	31.		1886.5499	125.7700	110.3855	12184.9507	(15)
DIST	32.		51.7500	51.7500	0.0	0.0	(1)
DIST	33.		5564.2998	428.0231	305.6474	93420.3133	(13)
DIST	36.		860.2499	430.1250	304.5155	92729.6955	(2)
DIST	37.		93.6000	31.2000	15.8216	250.3223	(3)
CTR	283.		26386.0877	382.4071	332.1590	110329.5650	(69)
DIST	1.		582.1000	83.1571	59.4119	3529.7087	(7)
DIST	2.		1545.0000	772.5000	401.6367	161312.0000	(2)
DIST	3.		10801.0491	337.5328	250.2542	62629.5042	(32)
DIST	5.		45.6900	45.6900	0.0	0.0	(1)
DIST	8.		997.4500	249.3625	182.7641	33402.7142	(4)
DIST	9.		1041.2998	1041.2998	0.0	0.0	(1)
DIST	11.		749.8999	749.8999	0.0	0.0	(1)
DIST	12.		601.3500	200.4500	58.0376	3368.3574	(3)
DIST	13.		811.7498	135.2916	144.3765	20845.2576	(6)
DIST	14.		8460.0493	769.0954	234.9555	55221.8900	(11)
DIST	17.		750.4500	750.4500	0.0	0.0	(1)
CTR	381.		16602.4493	210.1576	265.8351	61701.6707	(79)
DIST	1.		1372.4998	152.5000	228.3751	52155.9973	(9)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHAW

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	3.		561.0000	112.2000	86.7616	7527.5750	(5)
DIST	7.		1072.2500	119.1389	186.2313	34682.0933	(9)
DIST	8.		772.7500	154.5500	79.8740	6379.8555	(5)
DIST	9.		80.0000	80.0000	0.0	0.0	(1)
DIST	11.		673.0000	336.5000	458.2052	209952.0000	(2)
DIST	12.		5840.6959	648.9607	422.6038	178593.6975	(9)
DIST	14.		526.5000	175.5000	0.8660	0.7500	(3)
DIST	30.		640.7500	213.5833	178.3827	21820.3958	(3)
DIST	31.		1780.6000	84.7905	54.9127	3015.4004	(21)
DIST	32.		79.0000	79.0000	0.0	0.0	(1)
DIST	33.		1771.6998	177.1700	78.8893	6223.5180	(10)
DIST	36.		1431.7000	1431.7000	0.0	0.0	(1)
CTR	382.		14097.2491	243.0560	257.9537	66525.8005	(58)
DIST	1.		954.2500	238.5625	269.1761	72455.7056	(4)
DIST	3.		6388.4593	319.4230	300.0435	90026.1229	(20)
DIST	8.		1989.8000	180.8909	92.5379	8563.2710	(11)
DIST	12.		413.9000	206.9500	11.2430	126.4049	(2)
DIST	13.		37.0000	18.5000	0.0	0.0	(2)
DIST	14.		2301.6499	575.4125	506.1854	256223.6407	(4)
DIST	31.		697.8000	139.5600	105.0673	11039.1822	(5)
DIST	33.		1040.6499	173.4417	91.1043	8299.9918	(6)
DIST	34.		74.0000	74.0000	0.0	0.0	(1)
DIST	36.		166.5000	166.5000	0.0	0.0	(1)
DIST	37.		32.6000	16.3000	1.8385	3.3800	(2)
CTR	481.		18026.2995	250.3653	315.3895	99470.5156	(72)
DIST	1.		1689.7500	337.9500	306.3415	93844.4500	(5)
DIST	3.		951.6999	158.6500	96.2043	9254.0875	(6)
DIST	5.		462.5000	462.5000	0.0	0.0	(1)
DIST	8.		1404.2500	175.5312	130.7916	17106.4423	(8)
DIST	9.		72.0000	72.0000	0.0	0.0	(1)
DIST	11.		120.7500	120.7500	0.0	0.0	(1)
DIST	12.		3667.0500	407.4500	376.8330	142003.0797	(9)
DIST	13.		1397.6499	698.8250	11.7723	138.6096	(2)
DIST	17.		494.0000	494.0000	0.0	0.0	(1)
DIST	30.		1275.0000	637.5000	57.2756	3280.5000	(2)
DIST	31.		2246.4499	118.2342	104.9583	11003.6223	(19)
DIST	33.		4104.2499	273.6167	503.1436	253153.4702	(15)
DIST	36.		140.7500	70.3750	73.0068	5330.2813	(2)
CTR	482.		24094.6481	388.6234	378.7749	143470.3953	(62)
DIST	1.		741.2500	370.6250	514.9505	265174.0313	(2)
DIST	3.		4130.9996	196.7143	108.3635	11765.8268	(21)
DIST	7.		787.8499	393.9249	335.3051	115427.9410	(2)
DIST	8.		2073.9497	207.3950	93.7621	8791.3237	(10)
DIST	11.		2015.0000	2015.0000	0.0	0.0	(1)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHAW

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	12.		3785.8998	378.5500	305.1224	93099.6818	(10)
DIST	13.		2412.6997	603.1749	206.4833	42635.3602	(4)
DIST	14.		7767.5996	706.1454	391.0071	152885.2917	(11)
DIST	30.		379.3999	379.3999	0.0	0.0	(1)

TOTAL CASES = 662

SPSS BATCH SYSTEM 11/30/83

FILE MASTEF1 (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - - - -

CRITERION VARIABLE MHAW MANHOURS AVAILABLE FOR WORK
BROKEN DOWN BY YR FISCAL YEAR OF INSPECTION
BY DIST COAST GUARD DISTRICT

- -

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			192988.0794	291.5228	329.9034	108836.2676	(662)
YR	81.		60586.1980	243.3161	317.4695	100786.6821	(249)
DIST	1.		5043.0996	252.1550	332.0173	110235.6014	(20)
DIST	3.		1690.4999	130.0385	87.5936	7672.6340	(13)
DIST	5.		2540.7999	423.4666	214.6673	46107.9493	(6)
DIST	7.		1772.7500	177.2750	254.2116	64626.6018	(10)
DIST	8.		2915.6499	145.7825	102.2745	10460.0803	(20)
DIST	9.		152.0000	76.0000	5.6569	32.0000	(2)
DIST	11.		3258.3500	465.4786	410.3092	168353.6004	(7)
DIST	12.		13297.2499	554.0521	376.7257	141929.7997	(24)
DIST	13.		1397.6499	698.8250	11.7733	138.6096	(2)
DIST	14.		526.5000	175.5000	0.8660	0.7500	(3)
DIST	17.		1100.6000	366.5333	260.6077	67947.0070	(3)
DIST	30.		3299.0000	412.3750	258.2680	66712.6786	(8)
DIST	31.		6797.5999	95.7465	73.2313	5362.8259	(71)
DIST	32.		121.0000	60.5000	46.1630	664.5000	(2)
DIST	33.		9932.1494	191.0029	302.8191	91695.3991	(52)
DIST	36.		5934.6997	989.1166	735.8975	541545.7728	(6)
YR	82.		73510.6455	279.5646	305.2072	93151.4530	(263)
DIST	1.		3210.2000	321.0200	383.7708	147284.0056	(10)
DIST	2.		325.2000	325.2000	0.0	0.0	(1)
DIST	3.		10906.4989	253.6444	229.5563	52700.4021	(43)
DIST	5.		816.5000	816.5000	0.0	0.0	(1)
DIST	7.		1082.0999	216.4200	247.6719	61341.3577	(5)
DIST	8.		9453.7994	175.0704	109.7271	12040.0347	(54)
DIST	11.		3630.7000	1210.2333	705.2132	497325.5882	(3)
DIST	12.		8924.1997	343.2384	265.8543	70678.5142	(26)
DIST	13.		2486.6997	355.2428	342.0179	116976.2242	(7)
DIST	14.		16346.1490	583.7910	475.3236	225751.0799	(28)
DIST	30.		850.8999	283.6333	83.9106	7040.9940	(3)
DIST	31.		3934.1498	131.1383	103.5159	10715.5441	(30)
DIST	32.		225.2500	56.3125	31.8240	1012.7656	(4)
DIST	33.		9248.7494	308.2916	260.7310	67980.6554	(30)
DIST	34.		74.6000	74.6000	0.0	0.0	(1)
DIST	36.		1942.4999	323.7500	184.2475	33947.2802	(6)
DIST	37.		390.4495	39.0450	23.4612	550.4297	(10)
YR	83.		58491.2359	392.5586	370.4626	137242.5502	(149)
DIST	1.		2044.5995	127.7875	136.5307	18640.6295	(16)

SPSS BATCH SYSTEM 11/30/82

CRITERION VARIABLE MHAW

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	2.		2730.7000	910.2333	370.9008	137567.3999	(3)
DIST	3.		19646.5566	333.3830	265.0112	63527.4717	(59)
DIST	5.		1477.6900	738.8450	980.2652	960927.7258	(2)
DIST	7.		930.7000	930.7000	0.0	0.0	(1)
DIST	8.		3206.7497	160.3375	143.9431	20719.6227	(20)
DIST	9.		1129.7998	564.8999	673.7312	453913.7339	(2)
DIST	11.		2972.0999	990.7000	310.3390	96334.4904	(3)
DIST	12.		2040.8500	408.1700	422.3724	178398.4595	(5)
DIST	13.		2186.1996	198.7454	281.3614	79164.2433	(11)
DIST	14.		18976.5568	759.0640	325.5298	105969.9091	(25)
DIST	17.		942.6499	471.3250	354.7423	125821.5057	(2)

TOTAL CASES = 662

SPSS BATCH SYSTEM 11/30/83

FILE MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - -

CRITERION VARIABLE MHLT MANHOURS LOST TO TRAVEL
BROKEN DOWN BY QTR QUARTER AND FISCAL YEAR
BY DIST COAST GUARD DISTRICT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			33754.5577	50.9888	83.8532	7031.3537	662)
QTR	181.		1147.1999	28.6800	34.3085	1177.0980	40)
DIST	1.		28.6500	14.3250	5.8336	34.0312	2)
DIST	5.		86.0000	43.0000	32.5269	1058.0000	2)
DIST	8.		240.6500	120.3250	142.5881	20331.3600	2)
DIST	11.		81.7500	40.8750	18.5616	344.5313	2)
DIST	12.		16.0000	16.0000	0.0	0.0	1)
DIST	17.		45.0000	45.0000	0.0	0.0	1)
DIST	30.		57.7500	28.8750	2.2981	5.2813	2)
DIST	31.		346.9500	26.6885	14.7923	218.8122	13)
DIST	33.		244.4500	16.2967	7.6139	57.9716	15)
QTR	182.		2816.3998	42.6727	32.7673	1073.6938	66)
DIST	1.		14.5000	14.5000	0.0	0.0	1)
DIST	3.		84.0000	42.0000	20.5061	420.5000	2)
DIST	8.		1030.3999	64.4000	35.6406	1270.2340	16)
DIST	12.		413.2500	82.6500	46.1985	2134.3000	5)
DIST	13.		18.0000	18.0000	0.0	0.0	1)
DIST	14.		350.3500	43.7937	25.4302	646.6931	8)
DIST	30.		39.3000	39.3000	0.0	0.0	1)
DIST	31.		333.8500	33.3850	18.5269	343.2445	10)
DIST	32.		87.7500	29.2500	13.6267	185.6875	3)
DIST	33.		197.2999	17.9364	10.1852	103.6205	11)
DIST	36.		155.2500	51.7500	44.9771	2022.9375	3)
DIST	37.		92.4500	18.4900	10.4089	108.3455	5)
QTR	183.		5118.0496	63.9756	64.0565	4103.2408	80)
DIST	1.		151.2500	16.8056	10.9449	119.7903	9)
DIST	2.		40.8000	40.8000	0.0	0.0	1)
DIST	3.		1473.4499	54.5722	47.5003	2256.2747	27)
DIST	5.		54.0000	54.0000	0.0	0.0	1)
DIST	7.		88.2000	88.2000	0.0	0.0	1)
DIST	8.		686.6500	42.9156	29.8331	890.0132	16)
DIST	9.		71.2500	71.2500	0.0	0.0	1)
DIST	11.		564.7998	282.3999	17.5361	307.5152	2)
DIST	12.		264.0000	162.0000	108.1873	11704.5000	2)
DIST	13.		276.5500	55.3100	48.9464	2395.7454	5)
DIST	14.		1269.5499	90.6821	70.7004	4998.5492	14)
DIST	17.		77.5500	77.5500	0.0	0.0	1)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHLT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE		N
CTR	281.		1972.0995	34.0017	36.0873	1302.2965	(	58)
DIST	1.		60.2500	15.0625	11.4046	130.0639	(	4)
DIST	3.		68.0000	34.0000	14.9907	224.7199	(	2)
DIST	5.		317.2000	105.7333	37.5786	1412.1509	(	3)
DIST	7.		174.0500	174.0500	0.0	0.0	(	1)
DIST	8.		308.3500	61.6700	35.2351	1241.5108	(	5)
DIST	11.		58.6500	29.3250	34.8557	1214.9113	(	2)
DIST	12.		159.0000	31.8000	12.4817	155.7938	(	5)
DIST	17.		94.0000	94.0000	0.0	0.0	(	1)
DIST	30.		82.5000	82.5000	0.0	0.0	(	1)
DIST	31.		379.8500	21.1028	21.6719	469.6716	(	18)
DIST	32.		44.5000	44.5000	0.0	0.0	(	1)
DIST	33.		153.8000	12.8167	6.6532	44.2647	(	12)
DIST	36.		71.8500	23.9500	13.9603	194.8868	(	3)
CTR	282.		3386.7498	43.4199	33.4326	1117.7419	(	78)
DIST	1.		26.7000	8.9000	6.7550	45.6300	(	3)
DIST	2.		22.6000	22.6000	0.0	0.0	(	1)
DIST	3.		100.7500	50.3750	32.3501	1046.5313	(	2)
DIST	5.		56.5000	56.5000	0.0	0.0	(	1)
DIST	7.		181.6500	60.5500	32.4331	1051.9076	(	3)
DIST	8.		1059.6500	62.3441	32.6609	1066.8188	(	17)
DIST	11.		214.2000	107.1000	58.6191	3436.2045	(	2)
DIST	12.		459.0500	51.0056	26.3325	693.4010	(	9)
DIST	14.		277.8000	55.5600	28.8747	833.7504	(	5)
DIST	30.		25.5000	25.5000	0.0	0.0	(	1)
DIST	31.		492.2500	32.8167	34.5753	1195.4481	(	15)
DIST	32.		40.7500	40.7500	0.0	0.0	(	1)
DIST	33.		245.8000	18.9077	18.3067	335.1370	(	13)
DIST	36.		114.5500	57.2750	2.5102	6.3012	(	2)
DIST	37.		68.5000	22.8333	11.3477	128.7708	(	3)
CTR	283.		4889.3098	70.8596	136.6681	18678.1613	(	69)
DIST	1.		213.5500	30.5071	23.5744	555.7528	(	7)
DIST	2.		153.5000	76.7500	33.5876	1128.1250	(	2)
DIST	3.		1850.1495	57.8172	35.4235	1254.8145	(	32)
DIST	5.		6.0600	6.0600	0.0	0.0	(	1)
DIST	8.		199.1500	49.7875	26.1022	681.3272	(	4)
DIST	9.		82.5000	82.5000	0.0	0.0	(	1)
DIST	11.		36.1000	36.1000	0.0	0.0	(	1)
DIST	12.		184.9000	61.6333	4.8503	23.5259	(	3)
DIST	13.		1198.2000	199.7000	463.7515	215065.4615	(	6)
DIST	14.		831.4000	75.5818	35.0217	1226.5221	(	11)
DIST	17.		131.8000	131.8000	0.0	0.0	(	1)
CTR	381.		3169.5498	40.1209	43.6126	1902.0550	(	79)
DIST	1.		146.6000	16.2889	10.4466	109.1730	(	9)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHLT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	3.		383.7500	76.7500	45.2085	2043.8438	(5)
DIST	7.		165.5000	18.3889	22.8175	520.6586	(9)
DIST	8.		297.0000	59.4000	40.4101	1632.9758	(5)
DIST	9.		40.0000	40.0000	0.0	0.0	(1)
DIST	11.		191.5000	95.7500	67.5267	4560.1250	(2)
DIST	12.		595.2000	66.6444	35.3208	1247.5569	(9)
DIST	14.		106.3000	35.4333	7.9057	62.5634	(3)
DIST	30.		113.3000	37.7667	6.4071	41.0507	(3)
DIST	31.		495.2500	23.5833	30.1172	907.0463	(21)
DIST	32.		4.5000	4.5000	0.0	0.0	(1)
DIST	33.		561.7500	56.1750	78.1872	6113.2370	(10)
DIST	36.		64.3000	64.3000	0.0	0.0	(1)
CTR	382.		2195.5997	37.8621	38.6940	1497.2253	(58)
DIST	1.		61.5000	15.3750	4.5939	21.1042	(4)
DIST	3.		893.1000	44.6550	24.3971	595.2161	(20)
DIST	8.		423.7500	38.5227	18.3339	336.1337	(11)
DIST	12.		313.0999	156.5499	162.5561	26425.3714	(2)
DIST	13.		26.0000	13.0000	0.0	0.0	(2)
DIST	14.		189.4000	47.3500	34.1794	1168.2282	(4)
DIST	31.		125.7000	25.1400	18.7181	350.3608	(5)
DIST	33.		95.7000	15.9500	13.1027	171.6799	(6)
DIST	34.		3.6500	3.6500	0.0	0.0	(1)
DIST	36.		35.0000	35.0000	0.0	0.0	(1)
DIST	37.		23.1000	11.5500	0.9899	0.9800	(2)
CTR	481.		3848.4999	53.4514	134.1639	17999.9400	(72)
DIST	1.		289.0500	57.8100	65.8445	4335.4994	(5)
DIST	3.		597.3500	99.5583	94.0220	8840.1353	(6)
DIST	5.		57.1000	57.1000	0.0	0.0	(1)
DIST	8.		1315.5500	164.4437	383.3246	146937.7168	(8)
DIST	9.		38.5000	38.5000	0.0	0.0	(1)
DIST	11.		76.2500	76.2500	0.0	0.0	(1)
DIST	12.		346.1000	38.4556	10.5705	111.7353	(9)
DIST	13.		193.3500	96.6750	17.2180	296.4610	(2)
DIST	17.		93.3000	93.3000	0.0	0.0	(1)
DIST	30.		129.3500	64.6750	8.5914	73.8114	(2)
DIST	31.		310.9500	16.3658	12.9945	168.8556	(19)
DIST	33.		367.9000	24.5267	39.9194	1593.5549	(15)
DIST	36.		33.7500	16.8750	12.5511	157.5313	(2)
CTR	482.		5210.6995	84.0435	133.7675	17895.0906	(62)
DIST	1.		30.4500	15.2250	1.7324	3.0012	(2)
DIST	3.		931.5499	44.3595	21.1435	447.0469	(21)
DIST	7.		270.6500	135.3250	59.6506	3562.6107	(2)
DIST	8.		527.7000	52.7700	17.0662	291.2245	(10)
DIST	11.		55.0000	55.0000	0.0	0.0	(1)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHLT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	12.		809.4500	80.9450	43.5667	1898.0547	(10)
DIST	13.		223.8500	55.9625	44.7583	2003.3085	(4)
DIST	14.		2245.1997	204.1091	288.4922	83227.7226	(11)
DIST	30.		116.8500	116.8500	0.0	0.0	(1)

TOTAL CASES = 662

```
SPSS BATCH SYSTEM                                                     11/30/83
FILE   MASTER1  (CREATION DATE = 11/30/83)
- - - - - - - - - - - - - - - - - - -  D E S C R I P T I O N   O F   S U B P O P U L A T I O N S  - - - - - - - - - - - - - - - - -
CRITERION VARIABLE    MHLT        MANHOURS LOST TC
    BROKEN DOWN BY    YR          FISCAL YEAR OF I
             BY       DIST        COAST GUARD DIST
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			33754.5577	50.9838	83.8532	7031.3537	(662)
YR	81.		10137.3495	40.7122	79.4794	6316.9708	(249)
DIST	1.		524.6500	26.2325	36.4876	1331.3472	(20)
DIST	3.		1049.1000	80.7000	70.2225	4931.1988	(13)
DIST	5.		460.3000	76.7167	42.5832	1813.3284	(6)
DIST	7.		359.5500	35.9550	53.7201	2885.6454	(10)
DIST	8.		2161.5499	108.0775	241.5658	58354.0177	(20)
DIST	9.		78.5000	39.2500	1.0607	1.1250	(2)
DIST	11.		408.1500	58.3071	43.8481	1922.6502	(7)
DIST	12.		1120.9000	46.7042	27.7738	771.3833	(24)
DIST	13.		193.3500	96.6750	17.2160	296.4010	(2)
DIST	14.		106.3000	35.4333	7.9097	62.5634	(3)
DIST	17.		232.3000	77.4333	28.0903	789.0631	(3)
DIST	30.		382.9000	47.8625	20.5295	421.8712	(8)
DIST	31.		1535.0000	21.5915	21.6250	467.6390	(71)
DIST	32.		49.0000	24.5000	28.2843	800.0000	(2)
DIST	33.		1327.6999	25.5365	42.2996	1789.2556	(52)
DIST	36.		169.9000	28.3167	20.7971	432.5162	(6)
YR	82.		13609.8489	51.5525	73.4725	5398.2047	(264)
DIST	1.		133.1500	13.3150	5.1825	26.8584	(10)
DIST	2.		22.8000	22.8000	0.0	0.0	(1)
DIST	3.		2009.3999	44.6533	22.2581	495.4210	(45)
DIST	5.		56.5000	56.5000	0.0	0.0	(1)
DIST	7.		452.3000	90.4600	55.6691	3099.0406	(5)
DIST	8.		3041.6999	56.3278	29.9992	899.9544	(54)
DIST	11.		269.3000	89.7667	51.2313	2624.6425	(3)
DIST	12.		1994.8498	76.7250	55.3033	3058.4533	(26)
DIST	13.		267.8500	38.2643	38.6222	1491.6735	(7)
DIST	14.		3062.7497	109.3839	193.0875	37282.9491	(28)
DIST	30.		181.6500	60.5500	49.2430	2424.8772	(3)
DIST	31.		951.7999	31.7267	27.2219	741.0064	(30)
DIST	32.		128.5000	32.1250	12.5241	156.8542	(4)
DIST	33.		538.7999	17.9600	14.3289	205.3162	(30)
DIST	34.		9.6500	9.6500	0.0	0.0	(1)
DIST	36.		304.8000	50.8000	29.6256	877.6750	(6)
DIST	37.		164.0500	16.4050	9.6882	93.8614	(10)
YR	83.		10007.3593	67.1635	103.8459	10783.9635	(149)
DIST	1.		364.8000	22.8000	12.3158	335.4693	(16)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHLT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	2.		194.3000	64.7667	31.5415	994.8636	(3)
DIST	3.		3323.5998	56.3322	42.9511	1844.7930	(59)
DIST	5.		62.0600	31.0300	32.4845	1055.2418	(2)
DIST	7.		88.2000	88.2000	0.0	0.0	(1)
DIST	8.		885.7999	44.2900	28.6037	818.1733	(20)
DIST	9.		153.7500	76.8750	7.9550	63.2813	(2)
DIST	11.		600.8998	203.2999	142.7409	20374.9730	(3)
DIST	12.		548.9000	109.7800	85.3483	7284.3288	(5)
DIST	13.		1474.7495	134.0652	337.9008	114176.9754	(11)
DIST	14.		2100.9499	84.0380	57.2462	3277.1234	(25)
DIST	17.		209.3500	104.6750	38.3605	1471.5313	(2)

TOTAL CASES = 562

SPSS BATCH SYSTEM 11/30/83

FILE MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - - -

CRITERION VARIABLE MHTOT TOTAL MANHOURS PER OVERSEAS TRIP
BROKEN DOWN BY QTR QUARTER AND FISCAL YEAR
BY DIST COAST GUARD DISTRICT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			226752.5912	342.5266	355.3372	126264.5186	662)
QTR	181.		9861.2499	246.5312	262.6760	68998.6963	40)
DIST	1.		1000.6499	500.3250	483.1411	233256.9996	2)
DIST	5.		748.5000	374.2500	307.2379	94395.1250	2)
DIST	8.		433.2500	216.6250	226.8045	51440.2813	2)
DIST	11.		1724.5000	862.2500	323.5014	104655.1250	2)
DIST	12.		694.0000	694.0000	0.0	0.0	1)
DIST	17.		114.3000	114.3000	0.0	0.0	1)
DIST	30.		672.0000	336.0000	173.2412	30012.5000	2)
DIST	31.		1638.1000	126.0077	65.3018	4264.3313	13)
DIST	33.		2835.9500	189.0633	227.7944	51890.3112	15)
QTR	182.		16883.6952	255.8136	215.4903	47738.0048	66)
DIST	1.		1157.5000	1157.5000	0.0	0.0	1)
DIST	3.		353.5000	176.7500	112.7835	12720.1250	2)
DIST	6.		3995.7500	249.7344	158.8057	25219.2426	16)
DIST	12.		2220.0000	444.0000	319.2268	101905.7500	5)
DIST	13.		55.0000	55.0000	0.0	0.0	1)
DIST	14.		2585.9497	323.2437	200.0315	40012.5851	8)
DIST	30.		262.2998	262.2998	0.0	0.0	1)
DIST	31.		1683.6500	168.3650	108.6832	11812.0250	10)
DIST	32.		261.2500	87.0833	38.6946	1497.2708	3)
DIST	33.		2841.6998	258.3818	215.2441	46330.0324	11)
DIST	36.		1071.0000	357.0000	75.9585	5769.7500	3)
DIST	37.		356.7000	71.3400	26.7857	717.4718	5)
QTR	183.		37233.1491	465.4144	443.2505	196470.9832	80)
DIST	1.		1613.7500	179.3056	172.0114	29594.0943	9)
DIST	2.		1226.5000	1226.5000	0.0	0.0	1)
DIST	3.		10518.9995	389.5926	320.0628	102453.0056	27)
DIST	5.		1486.0000	1486.0000	0.0	0.0	1)
DIST	7.		1024.6999	1024.6999	0.0	0.0	1)
DIST	8.		2895.9500	180.9969	149.1796	22215.0360	16)
DIST	9.		159.7500	159.7500	0.0	0.0	1)
DIST	11.		2787.0000	1393.5000	342.9468	117612.5000	2)
DIST	12.		1803.5000	901.7500	727.2593	528906.1250	2)
DIST	13.		1651.0000	330.2000	440.1575	193738.6688	5)
DIST	14.		11796.0497	842.5750	434.6678	188936.0051	14)
DIST	17.		269.7500	269.7500	0.0	0.0	1)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHTOT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
CTR	281.		19215.4992	331.3017	400.5770	160461.8999	(58)
DIST	1.		1609.2000	402.3000	484.1954	234445.9680	(4)
DIST	3.		245.6000	122.8000	46.9519	2204.4806	(2)
DIST	5.		1733.0000	577.6667	268.5970	72144.3333	(3)
DIST	7.		674.5498	674.5498	0.0	0.0	(1)
DIST	8.		854.4000	170.8800	68.8210	4736.3284	(5)
DIST	11.		880.5000	440.2500	578.7069	334971.1250	(2)
DIST	12.		3270.5000	654.1000	300.6741	90404.9250	(5)
DIST	17.		637.5000	637.5000	0.0	0.0	(1)
DIST	30.		851.5000	851.5000	0.0	0.0	(1)
DIST	31.		1859.6500	103.3139	75.3299	5674.5923	(18)
DIST	32.		86.5000	86.5000	0.0	0.0	(1)
DIST	33.		1618.4996	134.8750	135.0849	18247.6191	(12)
DIST	36.		4434.0999	1478.0333	305.3316	93227.3892	(3)
CTR	282.		25038.1987	321.0025	325.1992	105754.5363	(78)
DIST	1.		398.4000	132.8000	102.4034	10486.2707	(3)
DIST	2.		348.0000	348.0000	0.0	0.0	(1)
DIST	3.		240.2500	120.1250	22.8042	520.0313	(2)
DIST	5.		873.0000	873.0000	0.0	0.0	(1)
DIST	7.		475.2999	158.4333	96.1228	9239.5926	(3)
DIST	8.		3484.5500	204.9735	87.9030	7726.9330	(17)
DIST	11.		1829.9998	914.9999	93.6210	8764.8994	(2)
DIST	12.		3376.7000	375.1889	267.9940	71820.7703	(9)
DIST	14.		4319.0999	863.8200	719.2325	517295.3208	(5)
DIST	30.		274.0000	274.0000	0.0	0.0	(1)
DIST	31.		2376.7998	158.4533	134.0165	17960.4280	(15)
DIST	32.		92.5000	92.5000	0.0	0.0	(1)
DIST	33.		5810.0996	446.9307	295.5637	87358.7087	(13)
DIST	36.		974.7998	487.3999	307.0259	94264.9348	(2)
DIST	37.		162.1000	54.0333	25.2469	637.4050	(3)
CTR	283.		31275.3990	453.2667	372.3106	138615.1524	(69)
DIST	1.		795.6500	113.6643	67.0753	4499.0389	(7)
DIST	2.		1698.5000	849.2500	435.6242	189768.1250	(2)
DIST	3.		12651.2000	395.3500	301.8224	91096.7541	(32)
DIST	5.		53.7500	53.7500	0.0	0.0	(1)
DIST	6.		1196.5998	299.1499	190.5184	36297.2553	(4)
DIST	9.		1123.7998	1123.7998	0.0	0.0	(1)
DIST	11.		786.0000	786.0000	0.0	0.0	(1)
DIST	12.		786.2498	262.0833	62.7676	3939.7743	(3)
DIST	13.		2009.5500	334.9917	572.0448	327235.2004	(6)
DIST	14.		9291.4498	844.6773	229.4395	52642.6001	(11)
DIST	17.		862.2500	862.2500	0.0	0.0	(1)
CTR	381.		19771.5989	250.2785	301.6254	90983.9305	(79)
DIST	1.		1519.0998	168.7889	224.5648	50429.3365	(9)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHTOT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	3.		944.7500	188.9500	82.3835	6787.0438	(5)
DIST	7.		1237.7500	137.5278	207.6682	43126.1007	(9)
DIST	8.		1069.7498	213.9500	92.7779	8607.7333	(5)
DIST	9.		120.0000	120.0000	0.0	0.0	(1)
DIST	11.		864.5000	432.2500	525.7239	276396.1250	(2)
DIST	12.		6440.5000	715.6111	424.1552	179907.6111	(9)
DIST	14.		632.8000	210.9333	8.7757	77.0135	(3)
DIST	30.		754.0498	251.3499	184.7816	34144.2519	(3)
DIST	31.		2275.8500	108.3738	72.1367	5203.7005	(21)
DIST	32.		83.5000	83.5000	0.0	0.0	(1)
DIST	33.		2333.4495	233.3449	132.0474	17436.5033	(10)
DIST	36.		1496.0000	1496.0000	0.0	0.0	(1)
CTR	382.		16293.2492	280.9181	271.0101	73446.4887	(58)
DIST	1.		1015.7500	253.9375	273.1366	74604.6823	(4)
DIST	3.		7281.5997	364.0800	311.7149	97166.1579	(20)
DIST	8.		2413.5500	219.4136	103.5941	10731.7322	(11)
DIST	12.		727.0000	363.5000	173.2412	30012.5000	(2)
DIST	13.		63.0000	31.5000	0.0	0.0	(2)
DIST	14.		2491.0500	622.7625	522.5918	273102.2214	(4)
DIST	31.		823.4996	164.6999	105.1005	11046.1072	(5)
DIST	33.		1136.3500	189.3917	85.3927	7291.9103	(6)
DIST	34.		84.2500	84.2500	0.0	0.0	(1)
DIST	36.		201.5000	201.5000	0.0	0.0	(1)
DIST	37.		55.7000	27.8500	0.8485	0.7200	(2)
CTR	481.		21874.7991	303.8167	360.4830	129948.0071	(72)
DIST	1.		1978.8000	395.7600	339.8293	115483.9462	(5)
DIST	3.		1549.2500	258.2083	149.4598	22338.2354	(6)
DIST	5.		519.5999	519.5999	0.0	0.0	(1)
DIST	8.		2719.8000	339.9750	511.2796	261406.6072	(8)
DIST	9.		110.5000	110.5000	0.0	0.0	(1)
DIST	11.		197.0000	197.0000	0.0	0.0	(1)
DIST	12.		4013.1495	445.9055	378.5709	143315.9426	(9)
DIST	13.		1591.0000	795.5000	28.9914	840.5000	(2)
DIST	17.		587.2998	587.2998	0.0	0.0	(1)
DIST	30.		1404.3499	702.1749	48.6842	2370.1512	(2)
DIST	31.		2557.3999	134.6000	118.2192	13975.7799	(19)
DIST	33.		4472.1497	298.1433	503.9869	254002.7622	(15)
DIST	36.		174.5000	87.2500	60.4576	3655.1250	(2)
CTR	482.		29305.3490	472.6609	403.0213	162426.1605	(62)
DIST	1.		771.7000	385.8500	516.6829	266961.2093	(2)
DIST	3.		5062.5497	241.0738	123.5805	15204.5586	(21)
DIST	7.		1058.5000	529.2500	399.1618	159330.1250	(2)
DIST	8.		2601.6500	260.1650	95.1796	9059.1518	(10)
DIST	11.		2070.0000	2070.0000	0.0	0.0	(1)

SPSS BATCH SYSTEM 11/30/83

CRITERION VARIABLE MHTOT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
DIST	12.		4595.3499	459.5350	318.6448	101534.4876	(10)
DIST	13.		2636.5496	659.1374	161.7251	26154.9941	(4)
DIST	14.		10012.7998	910.2545	402.1456	162526.3743	(11)
DIST	30.		496.2500	496.2500	0.0	0.0	(1)

TOTAL CASES = 662

SPSS BATCH SYSTEM 11/30/83

FILE MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - - -

CRITERION VARIABLE MHTOT TOTAL MANHOURS PER OVERSEAS TRIP
BROKEN DOWN BY YR FISCAL YEAR OF INSPECTION
BY DIST COAST GUARD DISTRICT

- -

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			226752.5912	342.5256	355.3372	126264.3186	662)
YR	81.		70723.5470	284.0303	338.7856	114775.6832	249)
DIST	1.		6367.7497	318.3375	340.2816	115791.5711	20)
DIST	3.		2739.6000	210.7385	119.8625	14367.0165	13)
DIST	5.		3001.0999	500.1833	240.3250	57758.0405	6)
DIST	7.		2112.2998	211.2300	304.3919	92654.4585	10)
DIST	8.		5077.1998	253.8600	327.6034	107324.0153	20)
DIST	9.		230.5000	115.2500	6.7175	45.1250	2)
DIST	11.		3666.5000	523.7857	424.7622	180439.9048	7)
DIST	12.		14418.1499	600.7562	379.0643	143689.7272	24)
DIST	13.		1591.0000	795.5000	28.9914	840.5000	2)
DIST	14.		632.8000	210.9333	8.7757	77.0133	3)
DIST	17.		1339.0998	446.3666	288.6714	83331.1899	3)
DIST	30.		3681.8997	460.2375	275.8356	76085.2705	8)
DIST	31.		8330.9999	117.3380	85.7658	7355.2061	71)
DIST	32.		170.0000	85.0000	2.1213	4.5000	2)
DIST	33.		11260.0488	216.5394	308.2617	95025.2406	52)
DIST	36.		6104.3999	1017.4333	746.4683	557214.9940	6)
YR	82.		87520.4961	331.5170	321.0672	103084.1200	264)
DIST	1.		3343.3499	334.3350	386.2601	149196.9011	10)
DIST	2.		348.0000	348.0000	0.0	0.0	1)
DIST	3.		12977.8994	288.3978	237.3287	56329.6609	45)
DIST	5.		873.0000	873.0000	0.0	0.0	1)
DIST	7.		1534.3999	306.8800	292.6762	85659.3489	5)
DIST	8.		12495.4999	231.3981	116.3621	13544.7998	54)
DIST	11.		3899.9998	1299.9999	670.1176	449057.5437	3)
DIST	12.		10919.0499	419.9635	280.6406	78759.1600	26)
DIST	13.		2754.5496	393.5071	350.5681	122898.0207	7)
DIST	14.		19408.8994	693.1750	493.3792	243423.0367	28)
DIST	30.		1032.5498	344.1833	131.8235	17377.4418	3)
DIST	31.		4885.9494	162.8650	117.8153	13880.4338	30)
DIST	32.		353.7500	88.4375	31.7099	1005.5156	4)
DIST	33.		9787.5494	326.2516	256.0121	65542.2063	30)
DIST	34.		84.2500	84.2500	0.0	0.0	1)
DIST	36.		2247.2998	374.5500	180.0805	32428.9831	6)
DIST	37.		574.5000	57.4500	27.6636	760.3800	10)
YR	83.		68506.5481	459.7889	410.6069	168596.0063	149)
DIST	1.		2409.4000	150.5875	137.1912	18821.4129	16)

SPSS BATCH SYSTEM 11/30/83

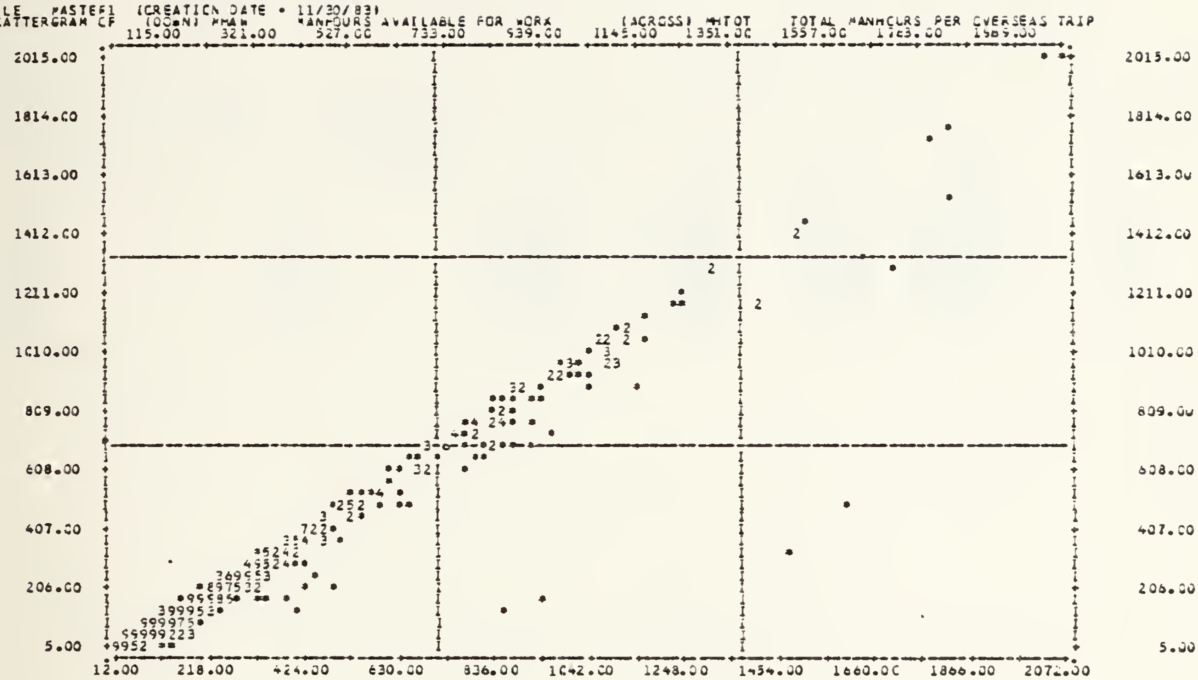
CRITERION VARIABLE MHTOT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE
DIST	2.		2925.0000	975.0000	377.0269	142149.2500
DIST	3.		23173.1994	392.7152	307.6121	94625.2232
DIST	5.		1539.7500	769.8750	1012.7537	1025670.0313
DIST	7.		1024.8999	1024.8999	0.0	0.0
DIST	8.		4092.5498	204.6275	155.0534	24041.5675
DIST	9.		1283.5498	641.7749	681.0882	463890.0130
DIST	11.		3573.0000	1191.0000	426.4054	181825.0000
DIST	12.		2589.7498	517.9500	508.9009	258986.4829
DIST	13.		3660.5500	332.8136	491.0390	241119.5295
DIST	14.		21087.4995	843.5000	352.5279	124275.9447
DIST	17.		1152.0000	576.0000	432.1029	186716.1250

TOTAL CASES = 662

SPSS BATCH SYSTEM 11/30/83

FILE MASTEF1 (CREATION DATE = 11/30/83)
SCATTERGRAM OF (DOWN) MHAW MANHOURS AVAILABLE FOR WORK (ACROSS) MHTOT TOTAL MANHOURS PER OVERSEAS TRIP



SPSS BATCH SYSTEM   11/30/83

FILE   MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - - - D E S C R I P T   S U B P O P U L A T I O N S - - - - - - - - - - - - - - - -

CRITERION VARIABLE   AMTB   AMOUNT BILLED
   BROKEN DOWN BY   QTR   QUARTER AND FISC

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			908830.1331	739.4875	971.7388	944276.2478	(1229)
QTR	181.		46575.7251	665.3675	881.4077	776875.4714	(70)
QTR	182.		70312.1040	532.6675	767.2572	588663.5645	(132)
QTR	183.		114935.5246	732.0734	935.8762	875871.0366	(157)
QTR	281.		82154.4326	702.1746	1017.7559	1035827.0971	(117)
QTR	282.		91136.7217	559.1210	755.1882	570309.1476	(163)
QTR	283.		105938.0565	706.2537	875.4005	766320.7720	(150)
QTR	381.		106648.7369	883.0474	1135.3043	1288915.7066	(121)
QTR	382.		74843.6311	840.9397	1031.1257	1063228.4526	(89)
QTR	481.		101817.6109	934.1065	1321.1336	1745393.8779	(109)
QTR	482.		114267.5895	944.3602	927.7666	860750.8769	(121)

TOTAL CASES =   1229

SPSS BATCH SYSTEM 11/30/83

FILE MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - - -

CRITERION VARIABLE AM78 AMOUNT BILLED
BROKEN DOWN BY YR FISCAL YEAR OF INSPECTION

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			908830.1331	739.4875	971.7388	944276.2478	1229)
YR	81.		337396.5056	809.1043	1120.2658	1255004.3562	417)
YR	82.		350560.0463	694.1783	870.9018	758469.8985	505)
YR	83.		220873.5812	719.4579	907.5567	823659.1631	307)

TOTAL CASES = 1229

SPSS BATCH SYSTEM 11/30/83

FILE MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - -

CRITERION VARIABLE BDBD BILLING DATE BEGINNING DATE
BROKEN DOWN BY YR FISCAL YEAR OF INSPECTION

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			243757.0000	198.3377	107.0464	11458.9290	(1229)
YR	81.		84313.0000	202.1894	101.6675	10336.2789	(417)
YR	82.		101064.0000	200.1267	119.3144	14235.9204	(505)
YR	83.		58380.0000	190.1629	91.6167	8393.6270	(307)

TOTAL CASES = 1229

SPSS BATCH SYSTEM 11/30/83

FILE MASTERI (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - - -

CRITERION VARIABLE BDBC BILLING DATE BEGINNING DATE
BROKEN DOWN BY DIST COAST GUARD DISTRICT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			243757.0000	198.3377	107.0464	11458.9290	1229)
DIST	1.		8716.0000	155.6429	50.0172	2501.7247	56)
DIST	2.		2620.0000	145.5556	34.1884	1168.6497	18)
DIST	3.		23424.0000	156.1600	70.5228	4973.4118	150)
DIST	5.		4757.0000	250.3684	127.7481	16319.5769	19)
DIST	7.		6435.0000	207.5806	77.3760	5987.0516	31)
DIST	8.		21176.0000	169.4080	76.7864	5896.1467	125)
DIST	9.		836.0000	139.3333	55.3588	2523.4667	6)
DIST	11.		14242.0000	273.8846	90.3546	8163.9864	52)
DIST	12.		24589.0000	225.2569	86.2350	7436.4704	109)
DIST	13.		5431.0000	159.7353	90.7258	8231.1702	34)
DIST	14.		64416.0000	308.2105	117.2003	13735.9170	209)
DIST	17.		1917.0000	112.7647	60.8210	3699.1912	17)
DIST	30.		4862.0000	211.3913	92.3771	8531.7036	23)
DIST	31.		13220.0000	116.9912	57.2852	3281.5961	113)
DIST	32.		1390.0000	198.5714	99.3241	9865.2857	7)
DIST	33.		38624.0000	176.3653	96.8823	9386.1870	219)
DIST	34.		76.0000	76.0000	0.0	0.0	1)
DIST	36.		4706.0000	181.0769	96.3672	9286.6338	26)
DIST	37.		1918.0000	137.0000	32.2406	1039.6462	14)

TOTAL CASES = 1229

SPSS BATCH SYSTEM 11/30/83

FILE MASTEFI (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - - -

CRITERION VARIABLE BOCD BILLING DATE COMPLETION DATE
BROKEN DOWN BY YR FISCAL YEAR OF INSPECTION

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			214258.0000	174.3352	102.1214	10428.7845	(1229)
YR	81.		75826.0000	181.8369	95.7367	9165.5214	(417)
YR	82.		89210.0000	176.6535	114.0602	13009.7269	(505)
YR	83.		49222.0000	160.3322	87.6416	7681.0788	(307)

TOTAL CASES = 1229

SPSS BATCH SYSTEM 11/30/83

FILE MASTER1 (CREATION DATE = 11/30/83)

- - - - - - - - - - - - - - - - - - D E S C R I P T I O N O F S U B P O P U L A T I O N S - - - - - - - - - - - - -

CRITERION VARIABLE BOCD BILLING DATE COMPLETION DATE
BROKEN DOWN BY DIST COAST GUARD DISTRICT

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			214258.0000	174.3252	102.1214	10428.7849	1229)
DIST	1.		7761.0000	138.5893	47.6733	2272.7192	56)
DIST	2.		1827.0000	101.5000	32.1142	1031.3235	18)
DIST	3.		20445.0000	136.3000	72.3166	5229.9832	150)
DIST	5.		4054.0000	213.3684	126.0362	15885.1345	19)
DIST	7.		5672.0000	182.9677	79.8012	6368.2323	31)
DIST	8.		18987.0000	151.8960	66.4528	4415.9610	125)
DIST	9.		679.0000	113.1667	36.9400	1364.5667	6)
DIST	11.		11658.0000	224.1923	94.3124	8894.8250	52)
DIST	12.		21674.0000	198.8440	86.4819	7479.1143	109)
DIST	13.		4394.0000	129.2353	85.8455	7369.4561	34)
DIST	14.		56428.0000	269.9904	116.3912	13546.9038	209)
DIST	17.		1399.0000	82.2941	65.7208	4319.2206	17)
DIST	30.		4367.0000	189.8696	89.8480	8072.6640	23)
DIST	31.		12654.0000	111.9823	57.7467	3334.6785	113)
DIST	32.		1371.0000	195.8571	100.5863	10117.6095	7)
DIST	33.		35401.0000	161.6484	102.2420	10453.4309	219)
DIST	34.		73.0000	73.0000	0.0	0.0	1)
DIST	36.		3671.0000	141.1923	85.3642	7287.0415	26)
DIST	37.		1743.0000	124.5000	29.3670	862.4231	14)

TOTAL CASES = 1229

APPENDIX D: DATA VALIDATION COMPUTER PROGRAM

```
FILE: VALPROG  WATFIV     APPENDIX D

$JOB
C     ******************************
C     *  LT ASHLEY  LT THOMPSON    *
C     *  THESIS PROJECT            *
C     *  DATA VALIDATION PROGRAM   *
C     *  23  SEPT. 1983            *
C     ******************************
C
C
C     ****  PURPOSE  ****
C     THE PURPOSE OF THIS PROGRAM IS TO AID IN VALIDATION OF THE DATA
C     CONTAINED IN THE OVERSEAS MARINE INSPECTION BILLING DATA FILE.
C     THIS PROGRAM USES THE VARIABLE DEFINITIONS USED IN THAT FILE.
C     EACH LINE OF DATA IS READ IN, CHECKED SEPARATELY AND PRINTED IF
C     AN ERROR IS FOUND WITHIN THE LINE.
C
C
C     ****  VARIABLE DECLARATIONS  ****
      INTEGER DIST, YR, QTR, MONTH, RANK, DUMA, BDBC, BCCD, DUMB
      REAL AMTB, MHAW, MHLT, MHTOT, MHTEST, TESTA,TESTB,TESTC,TESTD
      REAL TESTE,TESTF,TESTG,TESTH,TESTI,TESTJ,TESTK,TESTL,TESTM,TESTN
C
C
      WRITE (6,500)
      PRINT, 'THE FOLLOWING DATA LINES ARE IN ERROR:'
      PRINT, ' '
C     READ IN THE INPUT DATA PER LINE
5     READ (5,1000) DIST,YR,QTR,MONTH,RANK,AMTB,DUMA,BDBC,BCCD,MHAW,
     1MHLT,MHTOT,DUMB
C
C
      IF (DIST.EQ.99) GO TO 200
C     THE FOLLOWING IFS VERIFY THAT MHAW AND MHLT SUM TO MHTOT.
C     THE TEST VARIABLES ARE USED TO CORRECT FOR ROUNDING ERROR WITHIN
C     THE COMPUTER.
      MHTEST= MHAW + MHLT
      TESTA = MHTEST + .001
      TESTB = MHTEST + .002
      TESTC = MHTEST + .0001
      TESTD = MHTEST + .0002
      TESTE = MHTEST + .0003
      TESTF = MHTEST + .00001
      TESTG = MHTEST + .00002
      TESTH = MHTEST + .00003
      TESTI = MHTEST - .001
      TESTJ = MHTEST - .0001
      TESTK = MHTEST - .00001
      TESTL = MHTEST - .000001
      TESTM = MHTEST - .0002
      TESTN = MHTEST - .00002
C
C
      IF (MHTEST.EQ. MHTOT) GO TO 10
      IF (TESTA .EQ. MHTOT) GO TO 10
      IF (TESTB .EQ. MHTOT) GO TO 10
      IF (TESTC .EQ. MHTOT) GO TO 10
      IF (TESTD .EQ. MHTOT) GO TO 10
      IF (TESTE .EQ. MHTOT) GO TO 10
      IF (TESTF .EQ. MHTOT) GO TO 10
      IF (TESTG .EQ. MHTOT) GO TO 10
      IF (TESTH .EQ. MHTOT) GO TO 10
      IF (TESTJ .EQ. MHTOT) GO TO 10
      IF (TESTK .EQ. MHTOT) GO TO 10
      IF (TESTL .EQ. MHTOT) GO TO 10
      IF (TESTM .EQ. MHTOT) GO TO 10
      IF (TESTN .EQ. MHTOT) GO TO 10
      GO TO 100
C
C     THE FOLLOWING IFS VERIFY THAT THE DUMMY VARIABLES ARE ASSIGNED
C     PROPER VALUES.
C
10    IF ((DUMA.NE.0).AND.(DUMA.NE.1)) GO TO 100
```

```
      IF ((DUMB.NE.0).AND.(DUMB.NE.2)) GO TO 100
      IF ((AMTB.EQ.0.).AND.(DUMA.NE.0)) GO TO 100
      IF ((DUMA.EQ.0).AND.(AMTB.NE.0.)) GO TO 100
      IF ((MHTOT.EQ.0.).AND.(DUMB.NE.0)) GO TO 100
      IF ((DUMB.EQ.0).AND.(MHTOT.NE.0.)) GO TO 100
C
C     THE FOLLOWING IFS VERIFY THAT THE VARIABLE 'RANK' IS WITHIN THE
C     PROPER RANGE OF VALUES.
C
      IF (RANK.GT.24) GO TO 100
      IF (RANK.LT.0) GO TO 100
      IF ((RANK.EQ.7).OR.(RANK.EQ.8)) GO TO 100
      IF ((RANK.EQ.9).OR.(RANK.EQ.10)) GO TO 100
      IF ((RANK.EQ.14).OR.(RANK.EQ.15)) GO TO 100
      IF (RANK.EQ.16) GO TO 100
      IF ((RANK.EQ.20).OR.(RANK.EQ.21)) GO TO 100
C
C     THE FOLLOWING IFS VERIFY THAT THE VARIABLE 'DIST' IS WITHIN THE
C     PROPER RANGE OF VALUES.
C
      IF (DIST.LT.0) GO TO 100
      IF (DIST.GT.37) GO TO 100
      IF ((DIST.EQ.4).OR.(DIST.EQ.6)) GO TO 100
      IF ((DIST.EQ.10).OR.(DIST.EQ.15)) GO TO 100
      IF (DIST.EQ.16) GO TO 100
      IF ((DIST.GE.18).AND.(DIST.LE.29)) GO TO 100
C
C     THE FOLLOWING IF VERIFIES THAT 'BDCD' IS LESS THAN OR EQUALS BDBD.
C
      IF (BDCD.GT.BDBD) GO TO 100
C
C     THE FOLLOWING IFS VERIFY THE CONSISTENCY OF THE VARIABLES 'MONTH'
C     AND 'QTR' WITH EACH OTHER AND THEIR PROPER RANGE OF VALUES.
C
      IF ((MONTH.EQ.1080).AND.(QTR.EQ.181)) GO TO 50
      IF ((MONTH.EQ.1180).AND.(QTR.EQ.181)) GO TO 50
      IF ((MONTH.EQ.1280).AND.(QTR.EQ.181)) GO TO 50
      IF ((MONTH.EQ.181).AND.(QTR.EQ.281)) GO TO 50
      IF ((MONTH.EQ.281).AND.(QTR.EQ.281)) GO TO 50
      IF ((MONTH.EQ.381).AND.(QTR.EQ.281)) GO TO 50
      IF ((MONTH.EQ.481).AND.(QTR.EQ.381)) GO TO 50
      IF ((MONTH.EQ.581).AND.(QTR.EQ.381)) GO TO 50
      IF ((MONTH.EQ.681).AND.(QTR.EQ.381)) GO TO 50
      IF ((MONTH.EQ.781).AND.(QTR.EQ.481)) GO TO 50
      IF ((MONTH.EQ.881).AND.(QTR.EQ.481)) GO TO 50
      IF ((MONTH.EQ.981).AND.(QTR.EQ.481)) GO TO 50
      IF ((MONTH.EQ.1081).AND.(QTR.EQ.182)) GO TO 50
      IF ((MONTH.EQ.1181).AND.(QTR.EQ.182)) GO TO 50
      IF ((MONTH.EQ.1281).AND.(QTR.EQ.182)) GO TO 50
      IF ((MONTH.EQ.182).AND.(QTR.EQ.282)) GO TO 50
      IF ((MONTH.EQ.282).AND.(QTR.EQ.282)) GO TO 50
      IF ((MONTH.EQ.382).AND.(QTR.EQ.282)) GO TO 50
      IF ((MONTH.EQ.482).AND.(QTR.EQ.382)) GO TO 50
      IF ((MONTH.EQ.582).AND.(QTR.EQ.382)) GO TO 50
      IF ((MONTH.EQ.682).AND.(QTR.EQ.382)) GO TO 50
      IF ((MONTH.EQ.782).AND.(QTR.EQ.482)) GO TO 50
      IF ((MONTH.EQ.882).AND.(QTR.EQ.482)) GO TO 50
      IF ((MONTH.EQ.982).AND.(QTR.EQ.482)) GO TO 50
      IF ((MONTH.EQ.1082).AND.(QTR.EQ.183)) GO TO 50
      IF ((MONTH.EQ.1182).AND.(QTR.EQ.183)) GO TO 50
      IF ((MONTH.EQ.1282).AND.(QTR.EQ.183)) GO TO 50
      IF ((MONTH.EQ.183).AND.(QTR.EQ.283)) GO TO 50
      IF ((MONTH.EQ.283).AND.(QTR.EQ.283)) GO TO 50
      IF ((MONTH.EQ.383).AND.(QTR.EQ.283)) GO TO 50
      IF ((MONTH.EQ.483).AND.(QTR.EQ.383)) GO TO 50
      IF ((MONTH.EQ.583).AND.(QTR.EQ.383)) GO TO 50
      IF ((MONTH.EQ.683).AND.(QTR.EQ.383)) GO TO 50
      GO TO 100
C
C     THE FOLLOWING IFS VERIFY THE CONSISTENCY OF THE VARIABLES 'QTR'
C     AND 'YR' WITH EACH OTHER AND THEIR PROPER RANGE OF VALUES.
C
```

```
50     IF (QTR.EQ.181.AND.YR.EQ.81) GO TO 5
       IF (QTR.EQ.281.AND.YR.EQ.81) GO TO 5
       IF (QTR.EQ.381.AND.YR.EQ.81) GO TO 5
       IF (QTR.EQ.481.AND.YR.EQ.81) GO TO 5
       IF (QTR.EQ.182.AND.YR.EQ.82) GO TO 5
       IF (QTR.EQ.282.AND.YR.EQ.82) GO TO 5
       IF (QTR.EQ.382.AND.YR.EQ.82) GO TO 5
       IF (QTR.EQ.482.AND.YR.EQ.82) GO TO 5
       IF (QTR.EQ.183.AND.YR.EQ.83) GO TO 5
       IF (QTR.EQ.283.AND.YR.EQ.83) GO TO 5
       IF (QTR.EQ.383.AND.YR.EQ.83) GO TO 5
100    WRITE (6,2000) DIST,YR,QTR,MONTH,RANK,AMTB,DUMA,BDBD,BCCD,MHAW,
      1MHLT,MHTOT,DUMB
       PRINT, MHTOT, MHTEST
       GO TO 5
200    STOP
500    FORMAT ('1',2X)
1000   FORMAT (I2,2X,I2,2X,I3,2X,I4,2X,I2,2X,F8.2,1X,I1,1X,I3,1X,I3,2X,
      1F7.2,2X,F7.2,2X,F7.2,2X,I1)
2000   FORMAT ('0',I2,2X,I2,2X,I3,2X,I4,2X,I2,2X,F8.2,1X,I1,1X,I3,1X,I3,
      12X,F7.2,2X,F7.2,2X,F7.2,2X,I1)
-----  END
```

LIST OF REFERENCES

Anthony, Robert N. and Herzlinger, Regina E., Management Control in Nonprofit Organizations, Homewood, Illinois: Richard D. Irwin, Inc., 1980.

Ashford, Nicholas A., "The Limits of Cost-Benefit Analysis in Regulatory Decisions," Technology Review, May, 1980, pp. 70-72.

Commandant (G-MP), United States Coast Guard, "Annual Report to Congress: Delegations to the American Bureau of Shipping," June, 1983.

Comptroller General, General Accounting Office, How Effective is the Coast Guard in Carrying Out Its Commercial Vessel Safety Responsibilities? Washington, D.C.: Government Printing Office, 1979.

Cornell, Alexander H., The Decision-Maker's Handbook, Englewood Cliffs, New Jersey; Prentice-Hall, Inc., 1980.

Corti, G., "Risk, Uncertainty and Cost Benefit: Some Notes on Practical Difficulties for Project Appraisals," in Wolfe, J.N. (ed.) Cost Benefit and Cost Effectiveness, London, United Kingdom: George Allen & Unwin, Ltd., 1973.

Department of Defense, Defense Economic Analysis Council, Economic Analysis Handbook, 2nd edition, n.d.

Department of Transportation, Office of the Secretary of Transportation, United States Coast Guard and Office of Management and Budget, Coast Guard Roles and Missions, Washington, D.C.: Government Printing Office, 1982.

Department of Transportation, United States Coast Guard, Commandant Notice 7100, "Standard Personnel Costs," 1981-1983.

Department of Transportation, United States Coast Guard, "Closure of Overseas Marine Inspection Offices," Federal Register, Vol. 47, No. 55, March 22, 1982.

Department of Transportation, United States Coast Guard, Commercial Vessel Safety Operating Program Plan FY 85-94, January, 1982.

Dubin, Robert, "Organizational Effectiveness: Some Dilemmas of Perspective," in Spray, S. Lee (ed.) Organizational Effectiveness: Theory-Research-Utilization, Kent, Ohio: Kent State University Press, 1976.

Gramlich, Edward M., Benefit-Cost Analysis of Government Programs, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1981.

Hatry, Harry P., "The Use of Cost Estimates," in Goldman, Thomas A. (ed.) Cost Effectiveness Analysis: New Approaches in Decision-Making, New York, New York: Frederick A. Praeger, Inc., 1967.

Hatry, Harry P., Winnie, Richard E., and Fisk, Donald M., Practical Program Evaluation for State and Local Governments, Washington, D.C.: The Urban Institute, 1973.

Kohler, Heinz, Intermediate Microeconomics: Theory and Applications, Glenview, Illinois: Scott, Foresman and Company, 1982.

Maritime Transportation Research Board, Commission on Sociotechnical Systems, Critical Issues in Maritime Transportion, Washington, D.C.: National Academy Press, 1981.

McCullough, James D., "Estimating Systems Costs," in Goldman, Thomas A. (ed.) Cost Effectiveness Analysis: New Approaches in Decision-Making, New York, New York; Frederick A. Praeger, Inc., 1967.

Niskanen, William A. "Measures of Effectiveness," in Goldman, Thomas A. (ed.) Cost Effectiveness Analysis: New Approaches in Decision-Making, New York, New York: Frederick A. Praeger, Inc., 1967.

Quade, Edward S., "Introduction and Overview," in Goldman, Thomas A. (ed.) Cost Effectiveness Analysis: New Approaches in Decision-Making, New York, New York: Frederick A. Praeger, Inc., 1967.

_____, Analysis for Public Decisions, New York, New York: American Elsevier Publishing Co., Inc., 1975.

Sassone, Peter G. and Schaffer, William A., _Cost-Benefit Analysis: A Handbook_, New York, New York: Academic Press, Inc., 1978.

Smith. W.J., "Letter of Promulgation," in United States Coast Guard, _A Study of Cost Benefits Effectiveness of the Merchant Marine Safety Program_, Washington, D.C.: Government Printing Office, 1968.

Sorensen, James E. and Grove, Hugh D., "Cost-Outcome and Cost-Effectiveness Analysis: Emerging Nonprofit Performance Evaluation Techniques," _The Accounting Review_, Vol. LII, No. 3 (1977), pp. 658-675.

Steiner, George A. , _Top Management Planning_, London, United Kingdom: Macmillan Co., 1969.

United States Coast Guard, _A Study of Cost Benefits Effectiveness of the Merchant Marine Safety Program_, Washington, D.C.: Government Printing Office, 1968.

U.S. Congress. Subcommittee on Coast Guard and Navigation of the Committee on Merchant Marine and Fisheries. Report No. 97-355, _Semi-Paratus: The United States Coast Guard. 1981_, 97th Congress, 1st session. 1981. Washington,D.C.: Government Printing Office, 1981.

Williams, Alan, "Cost-benefit Analysis: Bastard Science? And/Or Insidious Poison in the Body Politick?" in Wolfe, J.N. (ed.) _Cost Benefit and Cost Effectiveness_, London, United Kingdom: George Allen & Unwin, Ltd., 1973.

INITIAL DISTRIBUTION LIST

		No. Copies
1.	Defense Technical Information Center Cameron Station Alexandria, Virginia 22314	2
2.	Defense Logistics Studies Information Exchange U.S. Army Logistics Management Center Fort Lee, Virginia 23801	1
3.	Library, Code 0142 Naval Postgraduate School Monterey, California 93943	2
4.	Department Chairman, Code 54 Department of Administrative Science Naval Postgraduate School Monterey, California 93943	1
5.	Professor Willis R. Greer, Code 54GK Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943	1
6.	Commandant (PTE) U.S. Coast Guard 2100 2nd St. S.W. Washington, D.C. 20593	2
7.	Professor Earl Brubaker, Code 6407 Department of Administrative Sciences Naval Postgraduate School Monterey, California 93943	1
8.	Lieutenant Allen L. Thompson, Jr. Route 5, Box 134B Darlington, S.C. 29532	2
9.	Lieutenant Mark E. Ashley 13711 Maddox Ct. Woodbridge, Va. 22193	2
10.	RADM Clyde T. Lusk (G-M) Office of Merchant Marine Safety U.S. Coast Guard 2100 2nd. S.W. Washington D.C. 20593	1

11. Commandant (G-MP)
U.S. Coast Guard
2100 2nd. St. S.W.
Washington, D.C. 20593

2

205331

Thesis
A7965
c.1

Ashley

Inspection of U.S. Flag Vessels in Foreign Countries: An application of cost effectiveness analysis.